ZOOLOGICAL SURVEY OF INDIA 1916

Government of Karnataka

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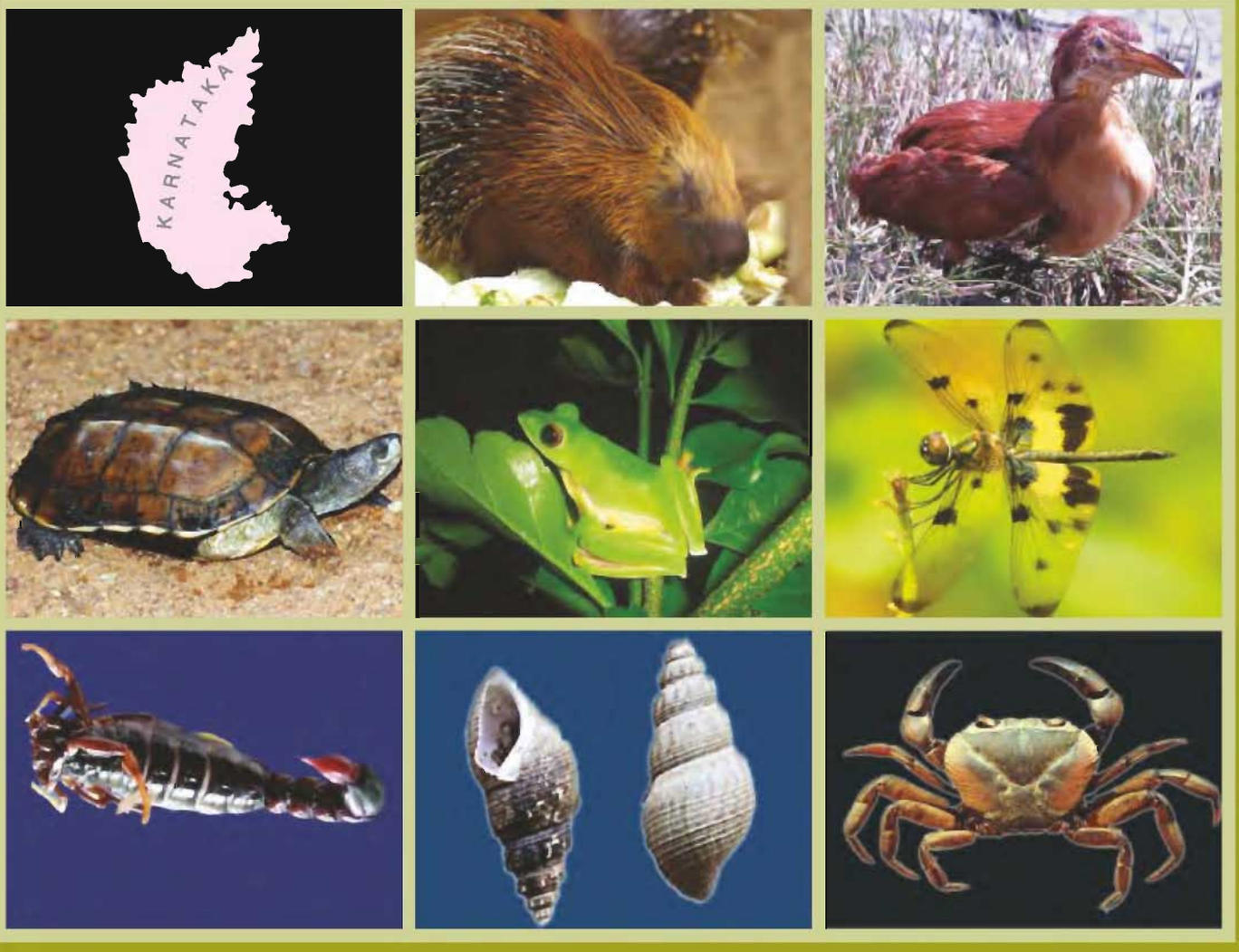
2011-2020 United Nations Decade on Biodiversity

STATE FAUNA SERIES, 21

FAUNA OF KARNATAKA



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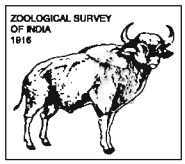

State Fauna Series, **21**

FAUNA OF KARNATAKA

Edited by
The Director, Zoological Survey of India, Kolkata

Zoological Survey of India
Kolkata

CITATION

Editor–Director, 2013. *Fauna of Karnataka, State Fauna Series,* **21**, 1-595. (Published by the Director, *Zool. Surv. India*, Kolkata)

Published : September, 2013

ISBN 978-81-8171-332-2

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Printing of this Publication Supported by Karnataka Biodiversity Board

PRICE
India : ₹ 3,000
Foreign : $ 165; £ 115

Published at the Publication Division by the Director, Zoological Survey of India, M-Block, New Alipore, Kolkata-700 053 and printed at Calcutta Repro Graphics, Kolkata–700 006.

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Date : 23/08/2013

FOREWORD

The State of Karnataka is a part of the highly biodiversity rich regions of India having five major forest types each having its unique flora and associated fauna. The State has around 4500 species of flowering plants, 600 species of birds, 160 species of reptiles and 160 species mammals and variety of other animal species. Karnataka government has declared around 16% of its total forest area under the Protected Area (PA) network. The State has taken various steps in the direction of increasing the forest cover as well as to safeguard the associated flora and fauna.

Similarly, Karnataka is one of the first States to have its own People's Biodiversity Registers (PBRs) in some areas there by empowering the locals to have their voices heard in the State's developmental activities without compromising the true value of local traditions, rural livelihood mechanism and sustainable sharing of biodiversity. I am sure that the document prepared jointly by the Zoological Survey of India (ZSI) in collaboration with Karnataka State Biodiversity Board, will greatly enhance the people's understanding of biodiversity with regard to some of the lesser known groups of animals.

Though the locals, especially tribals have vast knowledge about the animal species with which they share their daily life, their inability to translate such knowledge for wider use among locals seemed as a great impediment till date. I hope that the ZSI document will reach wider audience especially amongst scientists and policy makers at various Government departments of the State in enhancing their understanding about the faunal diversity and their importance in the ecosystem.

As expected by the Government of Karnataka, it is good to know that the institutions like the ZSI and BSI have come up with documents highlighting the faunal as well as floral diversity of the State of Karnataka. Our prime target is to organise inter and multidisciplinary institution in inventorying the biodiversity and associated knowledge through periodic monitoring. Wildlife Sanctuaries and National Parks of the State are the repository of the natural wealth and only by means of dedicated inventory studies we can unravel the new forms of life existing in such areas to the mankind.

I sincerely urge all school children and college students and teachers to get a copy of this document to know more about various life forms of animals found within the territory of Karnataka not only to increase the knowledge but to learn to live with such forms for the betterment of our future generations.

I appreciate the Director and the scientists of the of ZSI for bringing out such an important document revealing faunal biodiversity associated with various Protected Areas of the State of Karnataka.

(Dipak Sarmah)

STATE FAUNA SERIES

FAUNA OF KARNATAKA

No. 21 **2013** **1-595**

CONTENTS

Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 1-6, 2013

AN OVERVIEW

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PHYSIOGRAPHIC FEATURES

The state of Karnataka covers an area of 1,91,976 square kilometers (74,122 sq mi) which is 5.83% of the total geographical area of India and lies between latitude 11°32' 40.99' N to 18°20' 36°56' N, longitude 74°04' 23°08' E to 78°35' 10°96 E. The Karnataka state comprises 30 districts that are bordered by the Arabian Sea to the west, Goa to the northwest, Maharashtra to the north, Andhra Pradesh to the east, Tamil Nadu to the southeast, and Kerala to the southwest. It is the eighth largest Indian state by area and the ninth largest by its population. The state is divided meteorologically into three zones-coastal, north interior and south interior but is physio-graphically divided into 3 regions namely, (i) the coastal region of Karavali, (ii) the hilly Malenadu region comprising the Western Ghats, (iii) the northern Bayaluseeme region comprising the plains of the Deccan plateau which constitutes greater part of the state and the second-largest arid region in India. The highest point in Karnataka is the Mullayanagiri hills in Chickmagalur district which has an altitude of 1,929 m.

RAINFALL AND RIVERINE SYSTEMS

The state of Karnataka being a part of the Western Ghats experiences four seasons. The winter in January and February is followed by summer between March and May, the southwest monsoon season between June and September and the northeast monsoon season from October to till December. The coastal zone receives the heaviest rainfall with an average rainfall of about 3,638.5 mm (143 in) per annum, far in excess of the state average of 1,139 mm (45 in). Agumbe in the Shivamogga district receives the second highest annual rainfall in India. The highest recorded temperature is 45.6°C (114°F) at Raichur and the lowest recorded temperature is 2.8°C (37°F) at Bidar. There are seven river systems in Karnataka with their tributaries, drain the state and flow eastern and western sides. The east flowing rivers are Godavari, Krishna, Cauvery, North Pennar, South Pennar, Palar. The water-grid of the state is mainly composed of 2 major rivers, Krishna and its tributaries in the north, and the Cauvery and its tributaries in the south. The principal tributaries of Krishna are Ghataprabha, Malaprabha, Bhima, Vedavati and Tungabhadra, while the Cauvery are the Harangi, the Hemavathy, the Lakshmanathirtha, the Kabini, the Shimsha, the Arkavathi and the Suvarnavathy. All these rivers except the Kabini River, Arkavathy River and Suvarnavathy River originate and downstream into Karnataka. The river Cauvery is an Inter-State river in Southern India. It is one of the major rivers of the Peninsular India flowing east and running into the Bay of Bengal. The Cauvery rises at Talakaveri on the Brahmagiri Range of Hill in the Western Ghats, presently in the Coorg district of the State, at an elevation of 1.341m (4,400 ft.) above mean sea level. The other important river flowing through the state is Godavari with 5 tributaries. There are 9 river systems and 8 minor tributaries which are west flowing. In addition to the above main river basins there are 3 independent

Fig.1. Physical map of Karnataka state (Source: en.wikipedia.org)

catchment and minor tributaries in the West Flowing River system.

PROTECTED AREAS

The Karnataka State Biodiversity Board (www.kbb.kar.nic.in) provides detailed information on the biological resources including forest coverage, protected areas, wild life but excludes updated information on the flora and fauna. Karnataka has 4.33 Million ha of forest area which is around 22.61 percent of its geographical area. The state is endowed with most magnificent forests ranging from majestic evergreen forests of the Western Ghats to the scrub jungles of the plains. Most of the dense forests are located along Western Ghats region and 60% of the Western Ghats run through the state. The Western Ghats of Karnataka are one of the 25 global priority hotspots for conservation and one of the two on the Indian subcontinent. There are 5 National parks (Anshi National Park, Bandipur National Park, Bannerughatta National Park, Kudremukh National Park and Rajiv Gandhi (Nagarahole) National Park), 18 Wildlife and 9 Bird sanctuaries (Adichunchanagiri Peacock Sanctuary, Arabithittu Wildlife Sanctuary, Biligiri Rangaswamy Temple Wildlife Sanctuary, Bhadra Wildlife Sanctuary, Brahmagiri Wildlife Sanctuary, Cauvery Wildlife, Dandeli Wildlife Sanctuary, Daroji Sloth Bear Sanctuary, Ghataprabha Wildlife Sanctuary, Melukote Wildlife Sanctuary, Mookambika Wildlife Sanctuary, Nugu Wildlife Sanctuary, Pushpagiri Wildlife Sanctuary, Ranibennur Blackbuck Sanctuary, Sharavathi Valley Wildlife

Sanctuary, Shettihalli Wildlife Sanctuary, Someshwara Wildlife Sanctuary, Talakaveri Wildlife Sanctuary, Attiveri Bird Sanctuary, Gudavi Bird Sanctuary, Ranganathittu Bird Sanctuary, Bird Sanctuary (based on a small island on the Tunga river Kaggaladu Heronry), Kokkare Bellur Pelicanry, Magadi Bird Sanctuary Bankapura Peacock Sanctuary and Bonal Bird sanctuary). There are about 1424 sacred groves which act as conservation of biodiversity sites and repositories maintained by local communities on religious faith.

WILDLIFE

Karnataka is endowed with rich biodiversity. Two sub-clusters *viz.* Talacauvery and Kudremukh considered to be biodiversity hotspot that are part of the Western Ghats are on the tentative list of World Heritage Sites of UNESCO. The Bandipur and Nagarahole National Parks, which fall outside these sub-clusters, were included in the Nilgiri Biosphere Reserve in 1986, a UNESCO designation. Tree species found in the state are *Callophyllum tomentosa*, *Callophyllum wightianum*, *Garcina cambogia*, *Garcina morealla*, *Alstonia scholaris*, *Flacourtia montana*, *Artocarpus hirsutus*, *Artocarpus lacoocha*, *Cinnamomum zeylanicum*, *Grewia tilaefolia*, *Santalum album*, *Shorea talura*, *Emblica* <*http://en.wikipedia.org/wiki/Emblica*> officinalis, *Vitex altissima* and *Wrightia tinctoria*. Wildlife found in Karnataka are elephant, tiger, leopard, gaur, sambar deer, chital or spotted deer, muntjac, bonnet macaque, slender Loris, common palm civet, small Indian civet, sloth bear, dhole, striped hyena and golden jackal. Some of the birds found here are Great Hornbill, Malabar Pied Hornbill, Ceylon frogmouth, herons, ducks, kites, eagles, falcons, quails, partridges, lapwings, sandpipers, pigeons, doves, parakeets, cuckoos, owls, nightjars, swifts, kingfishers, bee-eaters and munias. Besides, the important species of birds from the state are spot-billed Pelican, Yellow-throated bulbul and Nilgiri wood-pigeon. Endangered species of fauna found in Karnataka include the Bengal tiger, Indian Elephant, Lion-tailed Macaque, Olive Ridley turtle and dhole, the Indian wild dog. Many endangered species of amphibians are found here including frogs, *Indirana brachytarsus*, *Microhyla sholigari*, *Minervarya sahyadris*, *Nyctibatrachus aliciae*, *Nyctibatrachus hussaini*, *Nyctibatrachus sanctipalustris*, *Philautus charius*, *Philautus wynaadensis*, *Ramanella mormorata* and *Rhacophorus lateralis* and a toad, *Bufo beddomii*. Other endangered species of fauna include the freshwater mussel *Pseudomulleria dalyi* and the Kolar leaf-nosed bat, *Hipposideros hypophyllus*. The Indian roller and the Indian elephant are recognized as the State bird and animal while sandalwood and the lotus are recognized as the State tree and flower respectively. However, the state wildlife like other vulnerable states is threatened by deforestation, habitat destruction, poaching, pollution leading to human-wildlife conflict.

FAUNAL DIVERSITY

Karnataka has a rich faunal resource largely due to geo-physical features and ecological consideration. The state of Karnataka being part of the Western Ghats remains unexplored and the records of new species of plants and animals continue to increase. The faunal components are relicts of Gondwana land as well as Eocene dispersing taxa. The state records 6 to 8 % of the known Indian fauna. The vertebrate fauna in view of their wildlife importance is higher than that of the invertebrates. In this volume an attempt has been made to update the number of known species of invertebrates and vertebrates excepting the protista. Of the 2700 species recorded from the state that comprise 1007 species of invertebrates and 1694 species of vertebrates (Table 1). Insects form the major constituents of the invertebrate fauna (874 species), more than half of the reported. Information on endemicity of insects also is very limited and that more endemics may exist in Western Ghats that pass through the state. The present work does not include marine fauna excepting the fishes and marine mammals.

Table 1. Faunal Inventory

Groups Studied	Number of Species			% of occurrence	Remarks
	Karnataka	India	World		
INVERTEBRATA					
Marine Sponges	11	451	8553	2.43	
Crustacea: Cladocera	29	190	620	15	
Crustacea : Decapoda : Freshwater Prawns	25	98	655	26	
Crustacea: Decapoda: Gecarcinucidae	10	91	1,476	11	
Annelida : Oligochatea (Freshwater)	8	130	1119	6	
Annelida : Earthworms	21				
Annelida : Leeches	10	63	676	16	
Insecta : Ephemeroptera	3	124	3000	2	
Insecta : Odonata	137	470	5740	29	
Insecta : Plecoptera	3	116	2000	3	
Insecta : Orthoptera	151	1033	24000	15	
Insecta : Orthoptera : Acridoidea	58				
Insecta : Diptera: Cecidomyiidae	30	398	6024	7	
Insecta : Diptera: Tabanidae	27	244	4500	11	
Insecta : Diptera: Psychodidae	23	88	2900	26	
Insecta : Diptera: Bombyliidae	42	138	4500	30	
Insecta : Diptera: Calliphoridae	16	63	1100	25	
Insecta : Diptera: Sarcophagidae	27	117	2600	23	
Insecta : Neuroptera	32	342	6256	9	
Insecta : Lepidoptera: Rhopalocera	318	1501	17500	1	
Insecta : Hemiptera (Aquatic & Semi-Aquatic)	78	288	4429	27	
Insecta : Homoptera: Membracidae	47	235	3200	20	
Insecta : Trichoptera	53	1046	13574	5	
Insecta : Siphonaptera	14	46	2000	20	
Insecta : Dermaptera	32	320	1800	10	
Insecta : Mantodea	23	162	2300	14	
Insecta : Embioptera	7	235	3200	3	
Insecta : Hymenoptera: Chalcidoidea: Pteromalidae	55	196	3500	29	
Insecta : Hymenoptera: Platygastroidea	57	300	4460	19	
Insecta : Coleoptera: Scarabaeidae	144	322	27000	44	
Insecta : Coleoptera: Tenebrionidae	47				

Groups Studied	Number of Species			% of occurrence	Remarks
	Karnataka	India	World		
Scorpionida	13	99	1500	13	
Centipedes	9	102	600	9	
Mollusca: Gastropoda (Freshwater)	29	193	3972	15	
VERTEBRATA					
Pisces (Freshwater)	213	667	12750	32	13 endemic; 13 new report
Pisces (Marine and Estuary)	570	667	16025	85	1 new record
Amphibia	88	314	5966	28	28 species endemic
Reptilia	126	518	9413	24	32 species endemic
Aves	534/560	1232	9028	43/45	22 Globally threatened
Mammalia	137	97	4629	25	4 sp. CR; 8 sp. EN; 18 sp. VU; 71 sp. LC
Total	**2710**	**12992**	**222565**	**21.52%**	

CR - Critically Endangered; **DD** - Data Deficient; **EN** - Endangered; **LC** - Least Concern; **NT** - Near Threatened; **VU** - Vulnerable.

INVERTEBRATES

Among the freshwater invertebrates, freshwater prawns (Crustacea: Decapoda) are recorded as dominant group followed by cladoceran or 'Water fleas'. Within the insect groups the "Dung beetles" (Coleoptera: Scarabaeidae) account for 44% of Indian records followed by the "bee-flies" (Diptera: Bombyliidae). There are 9 species of endemic centipedes with the equal number of leeches and scorpion fauna. 315 species of butterflies (Rhaphaloceridae: Lepidoptera) have been recorded from the Karnataka state.

VERTEBRATES

Among the vertebrates, fishes with little over 213 species were recorded from lentic and lotic freshwaters across the state. The Nilgiri Biosphere Reserve appears to have the richest fish resource, atleast 116 species belonging to 46 genera accommodated in 20 families of which 11 species are endemic. Endemicity of amphibians and reptiles appears to be high because of the Western Ghats. Information on 560 species of avian fauna is provided form the State. Nearly one third of the Indian mammals are reported in Karnataka with 25% of mammalian fauna distributed in the state.

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THE REPTILE DATABASE http://www.reptile-database.org/as onseptember2011

Plate 1

Freshwater and Land Crabs of Karnataka

Travancoriana schirnerae Bott

Barytelphusa Barytelphusa cunicularis (Westwood)

Oziotelphusa senex senex (Fabricius)

Barytelphusa Barytelphusa guerini (Milne-Edwards)

Spiralothelphusa hydrodroma (Herbst)

Plate 2

Odonata of Karnataka

Pseudagrion rubriceps

Ceriagrion coromandelianum

Rhinocyphabisignat

Vestalis gracilis

Euphaea dispar

Pseudagrion microcephalum

Palpopleura sexmaculata

Trithemis aurora

Acisoma panorpoides

Trithemis pallidinervis

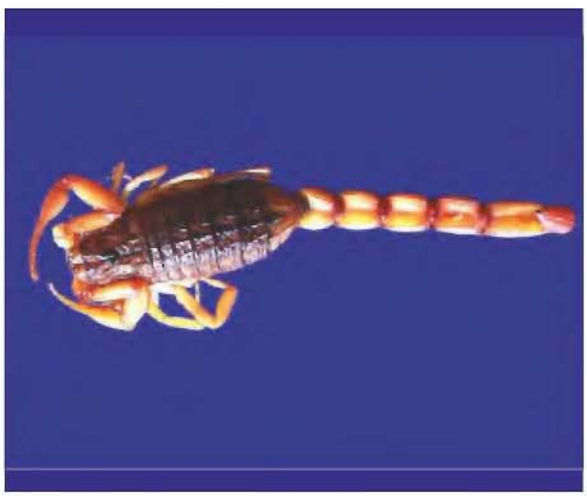
Brachydiplax sobrina

Brachythemis contaminata

Rhyothemis variegata

Tetrathemis platyptera

Plate 3
Scorpions of Karnataka



Mesobuthus tamulus tamulus (Fabricus)

Isometrus (Closotrichus) sankeriensis Tikader and Bastawade

Stenochirus politus Pocock

Plate 4
Molluscas of Karnataka

Indoplanorbis exustus

Gyraulus convexiusculus

Lymnaea (Pseudosuccinea) luteola f. impura

Lymnaea (Pseudosuccinea) luteola f. typica

Plaudomus (Paludomus) transchauricus

Thiara (Tarebia) lineata

Plate 5

Molluscas of Karnataka

Thiara (Melanoids) tuberculata

Thiara (Thiara) scabra

Stenothyra blanfordiana

Pila virens

Pila globosa

Bellamya dissimilis

Bellamya bengalensis

Plaudomus (Paludomus) annandalei

Plate 6
Amphibians of Karnataka

Duttaphrynus melanostictus

Bufo parietalis

Pedostibes tuberculosus

Fejervarya keralensis

Indirana beddomii

Clinotarsus curtipes

Plate 7
Amphibians of Karnataka

Rhacophorus malabaricus

Rhacophorus lateralis

Polypedates maculatus

Ramanella triangularis

Micrixalus saxicola

Fejervarya rufescens

Ichthyophis beddomei

Plate 8
Reptiles of Karnataka

Geckoella albofasciatus (Beddome 1870)

Cnemaspis mysoriensis (Jerdon 1853)

Cnemaspis indraneildasii (Bauer 2002)

Cnemaspis heteropholis (Bauer 2002)

Calotes rouxi (Dum. & Birb. 1837)

Dracodussumieri (Dum. & Bibr. 1837)

Ristella beddomii (Boulenger 1887)

Ophisops leschenaultii (Milne-Edwards 1829)

Plate 9
Reptiles of Karnataka

Rhinophis sanguineus (Beddome 1863)

Uropeltis ceylanicus (Cuvier 1829)

Amphiesma monticola (Jerdon 1853)

Rhabdops olivaceus (Beddome 1863)

Boiga nuchalis (Gunther 1875)

Dendrelaphis grandoculis (Boulenger, 1890)

Hypnale hypnale (Merrem 1802)

Trimeresurus malabaricus (Jerdon, 1854)

Plate 10

Birds of Karnataka

Pied Kingfisher

Pied Crested Cuckoo

Pheasant-tailed Jacana

Purple Heron

Purple-rumped Subird male

Purple Moorhen

Red-wattled Lapwing

Red-vented Bulbul

Plate 11

Birds of Karnataka

Ruff

Rosy Starling

Rose-ringed Parkeet

Rock pigeon

Red-crested Pochard Male

Red-crested Pochard Female

Red-whiskered Bulbul

River Tern

Plate 12

Birds of Karnataka

White-throated Munia

White-breasted Kingfisher

White-rumped Munia

White-headed Babbler

White-browed Bulbul

Common Tailorbird

Yellow-browed Bulbul

White-browed Bulbul

Plate 13

Birds of Karnataka

Yellow-wattled Lapwing

Yellow Wagtail

Wood Sandpiper

White-throated Fantail Flycatcher

White-necked Stork

House Swallow

Rufous-backed Shrike

Grey-Headed Flycatcher

Plate 14

Mammals of Karnataka

Indian Crested Porcupine

Indian Giant Squirrel

Indian Jackal

Jungle Cat

Slender Loris

Small Indian Civet

Striped Hyaena

Plate 15

Mammals of Karnataka

False Vampire Bat

Indian Flying Fox

Barking Deer

Bonnet Macaque

Lion-tailed Macaque

Nilgiri Languar

Tiger

Leopard

Plate 16

Mammals of Karnataka

Sambar

Wild Boar

Indian Pangolin

Three-striped Palm Squirrel

Grizzled Giant Squirrel

Black-naped Hare

Common Otter

Hanuman Langur

Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 7-20, 2013

MARINE SPONGES

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INTRODUCTION

Most of the studies done on the marine sponges of India are from the Southern India from Tamil Nadu, Gulf of Mannar and Palk Bay, Lakshadweep and Minicoy Islands, North West India from Gulf of Kutch and Cambay and Andaman and Nicobar Islands. Taxonomic information on the sponges of Karnataka coast is far from complete and prompted the necessity of this work.

To date, about 11,000 species have been formally described world wide of which 8, 553 species are considered valid (Van Soest RWM *et al*. 2012). At present only 451 species of marine sponge recorded from India as per Pattanayak (1991). Only four species of marine sponges are reported so far from Netrani Island, Karnataka by Karnataka Biodiversity Board (2007).

The Karnataka State of India has a 270 km long coast line bordering Arabian Sea. The habitats are mainly sandy with scattered rocks and rocky islands. The marine sponge fauna of the Karnataka coast is very poorly known.There is few scattered reports of marine sponges from Karnataka.

To update the sponge fauna of Karnataka coast, surveys were made during 2009 - 2011 by the scientists of ZSI and these include 8 species, all of which are new record from Karnataka coast. Four species reported earlier are also incorporated here. This work describes 12 species, 10 genera, 9 families from the coast of Karnataka State.

A review of literature indicates the major taxonomic information of the sponges of Tamil Nadu and adjacent Islands in the Gulf of Mannar consists the work of Ali (1956), Burton (1930, 1937), Burton and Rao (1932), Carter (1880, 1881), Dendy (1887, 1889, 1905), Pattanayak (1999, 2011), Pattanayak and Manna (2001), Rao (1941), Thomas (1985). The sponges of Andaman & Nicobar Islands were made over by Burton and Rao (1932), Pattanayak (2006) and Lakshadeep & Minicoy Islands sponges by Thomas (1979, 1980, 1980a) and that of Gulf of Kutch by Dendy (1916). But the studies on the marine sponge fauna of the Karnataka coast are very poorly known. Practically there is no Taxonomic study on marine sponges of the Karnataka coast except Karnataka Biodiversity Board (2007) which reports four species.

The higher classification of sponges and the Definitions upto the genus lavel are described here follows Hooper and Van Soest, 2002.

MATERIAL AND METHOD

Material studied in this work consists of the collections made during the recent surveys of the coast by Dr. M. K. Dev Roy, Dr. J. G. Pattanayak and S. Mitra of ZSI. Sponge materials were studied by the methods according to Pattanayak, 2011. While studying the spicules, measurements were made with the aid of micrometer and are given in mm. Figures were drawn with the aid of a camera lucida, Photographs of the specimens are given in the plates.

LIST OF SPONGES OF KARNATAKA COAST

Phylum PORIFERA Grant, 1836

Class DEMOSPONGIAE Sollas, 1885

Subclass TETRACTINOMORPHA Levi, 1953

Order HADROMERIDA Topsent, 1894

Family SUBERITIDAE Schmidt, 1870

Genus ***Suberites*** Nardo, 1833

1. *Suberites carnosus* (Johnston, 1842)*

Subclass CERACTINOMORPHA Levi, 1953

Order POECILOSCLERIDA Topsent, 1928

Suborder MICROCIONINA Hajdu, van

Family RASPAILIIDAE Hentschel, 1923

Subfamily RASPAILIINIAE Nardo, 1833

Genus ***Endectyon*** Topsent, 1920

Subgenus *Endectyon* Topsent, 1920

2. Endectyon (Endectyon) hornelli (Dendy, 1905)

Subfamily ECHINODICTYINAE Hooper & Van Soest, 2002

Genus ***Echinodictyum*** Ridley, 1881

3. *Echinodictyum longistylum* Thomas, 1968

Suborder MYXILLINA Hajdu, van Soest & Hooper, 1994

Family TEDANIIDAE Ridley & Dendy, 1886

Genus ***Tedania*** Gray, 1867

Subgenus *Tedania (Tedania)* Gray, 1867

4. *Tedania* (*Tedania*) *anhelans* (Lieberkuhn, 1859)*

Order HALICHONDRIDA Gray,1867

Family AXINELLIDAE Carter, 1875

Genus ***Axinella*** Schmidt, 1862

5. *Axinella donnani (*Bowerbank, 1873)*

Family HYMENIACIDONIDAE DE Laubenfels

Genus ***Auletta*** Schmidt, 1870

6. *Auletta elongata* Dendy, 1905

Family HALICHONDRIIDAE Gray, 1867

Genus ***Axinyssa*** Lendenfeld, 1897

7. *Axinyssa flabelliformis* (Keller)

Order HAPLOSCLERIDA Topsent, 1928

Suborder HAPLOSCLERINA Topsent,

Family CALLYSPONGIIDAE de Laubenfels

Genus ***Callyspongia*** Duchassaing & Michelotti, 1864

Subgenus *Callyspongia (Cladochalina)*

8. *Callyspongia (Cladochalina) diffusa* Ridley, 1884

9. *Callyspongia* (*Cladochalina*) *fibrosa* (Ridley and Dendy, 1886)*

Family CHALINIDAE Gray, 1867

Genus ***Haliclona*** Grant, 1836

Subgenus *Haliclona* Grant, 1836

10. *Haliclona* (*Haliclona*) *oculata* (Pallas, 1766)*

Subgenus *Gellius* Gray, 1867

11. Haliclona (Gellius) cellaria (Rao, 1941)

Family NIPHATIDAE Van Soest, 1980

Genus ***Amphimedon*** Duchassaing & Michelotti, 1864

12. *Amphimedon chloros* Ilan, Gugel & van Soest, 2004*

*New record from Karnataka coast

TAXONOMIC ACCOUNT

Phylum PORIFERA Grant, 1836

Class DEMOSPONGIAE Sollas, 1885

Porifera with siliceous spicules and/or a fibrous skeleton, or occasionally without a skeleton. Spicules are either monaxonic (either monactine or diactine) or tetraxonic (tetractine), never triaxonic.

Subclass TETRACTINOMORPHA Levi, 1953

Megascleres are tetraxonic and monaxonic, occuring together or separately; microscleres are astrose forms and derivatives; skeletal structure is usually radial or axially compressed.

Order HADROMERIDA Topsent, 1894

Radiate or subradiate architecture possessing pronounced cortical specialisation; considerable size distinction in the megascleres with smaller ones at the dermal part; Megasleres chiefly tylostyles with or without other categories.

Family SUBERITIDAE Schmidt, 1870

Hadromerida without cortex and without microscleres other than microrhabds; spicules tylostyles or styles, exceptionally oxeas, arranged in brushes or palisade in the peripheral region.

Genus ***Suberites*** Nardo, 1833

Suberitidae with ectosomal skeleton consisting of bouquets of smaller tylostyles carried by subradiate bundles of larger tylostyles; choanosomal skeleton confused or alveolar arrangement of larger tylostyles. If present, microscleres are spined centrotylote microstrongyles.

Type species: *Alcyonium domuncula* Olivi, 1792

1. *Suberites carnosus* (Johnston, 1842)
(Fig. 1a, b)

1842. Halichondria carnosus Johnston, i-xii, 1-264, pls. I-XXV.

1941. *Suberites carnosus*, Rao, p.426; Thomas, 1985, p. 310, pl. V, fig. 35.

Material examined: P3643/1, 4 ex., St. Merry Island, Distt. Udipi, Karnataka, 24.03.2010, Coll. J.G.Pattanayak & Party.

Description: Sponge encrusting, clathrous shaped, surface rough to touch, Colour- pale yellow in live, consistency fleshy; oscules terminal, circular, slit-like, contractile.

Skeleton - very dense mass of thick but loose bundles of tylostyles and fibres running in all directions and lie tangentially towards the surface; smaller spicules present in the dermal parts in brushes.

Megascleres - Tylostyles straight or curved, two size categories, 0.50-0.85 mm long, 0.020-0.025 mm wide and 0.20-0.40 mm long, 0.004-0.008 mm wide.

Microscleres - Absent.

Distribution: In India: Gulf of Mannar, Palk Bay; Chennai, Tamil Nadu; St. Merry Is., Karnataka.

Elsewhere: Cosmopolitan.

Remarks: *Suberites carnosus* (Johnston, 1842) is recorded for the first time from Karnataka coast.

Subclass CERACTINOMORPHA Levi, 1953

Spicules are monaxonic (either monactinal styles) or diactinal (oxeas-strongyles), never tetractinal (although modifications to the ends of some monaxonic spicules occur and may appaear to be superficially tetractinal); microscleres are diverse (chelae, oxeote, toxote, spheres) but never astrose.

Order POECILOSCLERIDA Topsent, 1928

Skeleton composed of siliceous spoicules; main skeleton composed of megascleres (monactinal, diactinal or both) and microscleres include meniscoid forms such as chelae (unique to the order), sigmas and sigmancistra-derivatives, and other diverse forms such as toxas, raphides, microxeas and disscate microrhabds.

Suborder MICROCIONINA Hajdu, van Soest & Hooper, 1994

Poecilosclerida with terminally spined ectosomal monactinal megascleres (occasionally modified to quasidiactinal forms); choanosomal megascleres diverse, consisting of at least two categories localized to distinct regions within the sketelon, or sometimes up to five categories including spicules echinating fibres in many taxa; isochelae of palmate origin, with diverse forms of toxas but lacking sigmas.

Family RASPAILIIDAE Hentschel, 1923

Microcionina with a special category of smaller ectosomal styles, oxeas or anisoxeas forming discrete bouquets around the protuding larger styles or oxeas.

Subfamily RASPAILIINIAE Nardo, 1833

Raspailiidae with echinating megascleres geometry ranging from microcionid-like club-shaped acanthostyles with small granular or erect spines, to club-shaped with strongly recurved or clavulate spines on the basal and distal ends of spicules, to acanthose rhabdostyles.

Genus ***Endectyon*** Topsent, 1920

Raspailiiniae with clavulate modification to acanthostyle geometry and acanthostyles confined to a particular region outside of the skeletal axis.

Subgenus ***Endectyon*** Topsent, 1920

Endectyon with subtylote echinating rhabdostyles bearing clavulate spines only on apex, grouped around protruding choanosomal styles in the ectosomal skeleton.

Type species: *Phakellia tenax* Schmidt, 1870.

2. *Endectyon (Endectyon) hornelli*
(Dendy, 1905)
(Fig. 2 a-d)

1905. *Raspailia hornelli* Dendy, p. 172, pl. II, fig. 7;

1937. Burton, p. 33, pl. 4, fig. 27;

1985. Thomas, p. 269, pl. III, fig. 9.

2002. *Endectyon* (*Endectyon*) *hornelli* : Hooper and Van Soest (Ed.). : 485 (Subgenus)

Diagnosis: Sponge body erect, pedunculate and branching in one plane. Branches divide dichotomously and growing tips often acutely pointed. Spongin is pale yellow in colour. Consistency tough and slightly resilient. Osculesrare, diameter 1 mm with radiating excurrent canals.

Skeleton: Skeleton is divisible into axial and extra axial parts. The axial reticulation is dense and fibres are cored by styles and oxeas and echinated by acanthostyles. The extra axial fibres arise from the axial part in an oblique manner. These extra axial fibres are interconnected by connectives in a scalariform pattern. Long styles are abundantly seen in an extra axial afibres and these fibres end in surface brushes.

Megascleres : (1) Long styles straight or curved (2) Small style hair like (3) Oxeas (4) Acanhostyles.

Microscleres - Absent.

Distribution: In India: Gulf of Mannar, Netrani Island (Karnataka).

Remarks: This species was reported from Netrani Island, Karnataka as *Raspailia hornell* by Biodiversity Board (2007). This species is not collected during the present surveys. Diagnosis is incorporated from the literature.

Subfamily ECHINODICTYINAE Hooper & Van Soest, 2002

Raspailiidae with regularly reticulate choanosomal skeletal structure, extra-axial skeleton vestigial or virtually absent and all but one species lacks ectosomal specialisation. Echinaaating megascleres are microcionid-like club-shaped acanthostyles.

Genus ***Echinodictyum*** Ridley, 1881

Exclusively reticulate choanosomal skeleton, without any trace of axial compression, cored exclusively by smooth oxeas, and vestigial radial extra-axial and ectosomal skeleton.

Type species: *Spongia mesenterina* Lamarck, 1814.

3. *Echinodictyum longistylum* Thomas, 1968
(Fig.3 a-e)

1968a. *Echinodictyum longistylum* Thomas, p. 246, pl. I, figs. A, B; pl. 2, figs. 1-3; Thomas, 1985, p. 251, pl. II, figs. 20.

Diagnosis: Sponge stalked; with foliaceous branches arising from the stalk. Stalk and branches with long styles arranged vertically and this arrangement gives a characteristic appearance to the specimen. Colour, dark gray, consistency leathery. Oscules and pores not traceable.

Skeleton composed of spicular tracts running longitudinally and each tract connected to the adjacent ones through vague bundles. Both main and connecting tracts are echinated by

acanthostyles. Long styles have their heads buried deep in the main tracts.

Megascleres - (3) Long styles or subtylostyles (4) Small hair-like styles (1) Long oxea (2) Small oxea (5) Acanthostyles.

Microscleres - absent

Distribution: Palk Bay; Netrani Island, Karnataka.

Remarks: This species was reported from Netrani Island, Karnataka by Biodiversity Board (2007). This species is not collected during the present surveys. Diagnosis is incorporated from the literature.

Suborder MYXILLINA Hajdu, van Soest & Hooper, 1994

Poecilosclerida with tridentate or polydentate chelae microscleres; palmate chelae absent; toxas absent; sigmas usually present. Differentiated ectosomal and choacosomal megascleres, although either or all may be lost secondarily. Ectosomal megascleres typically diactinal, commonly with aniso-terminations. Choanosomal megascleres usually styles, rarely oxeas or strongyles.

Family TEDANIIDAE Ridley and Dendy, 1886

Megascleres monactinal or diactinal smooth spicules; microscleres onychaetes, extremely thin, long, oxeote with a roughened surface; endosomal skeleton of megascleres diacts, usually tylotes or strongyles, usually with spined bases; sponges encrusting, massive or digitate in shape.

Genus ***Tedania*** Gray, 1867

1867. *Tedania* Gray, p.520

Ectosomal spicules diacts, usually tylotes with microspined heads, endosomal skeleton of styles which in some cases, may be spined; microscleres only onychaetes.

Subgenus ***Tedania*** Gray, 1867

1867. *Tedania* Gray, p. 520

2002. *Tedania (Tedania)*, Hooper and Van Soest, p. 629

Diagnosis: Smooth, relatively small styles, occasionally strongylote styles as structural megascleres and microspined tylotes as ectosomal megascleres. (Hooper and Van Soest, 2002).

Type species: *Reniera digitata* Schmidt, 1862.

Distribution: Cosmopolitan.

4. *Tedania (Tedania) anhelans* (Lieberkuhn, 1859) (Fig. 4 a-c)

1859. *Halichondria anhelans* Lieberkuhn, p. 365.

1887. *Tedania nigrescens* Vosmaer, p. 338; Burton & Rao, 1932, p. 353; Burton, 1937, 27, pl. 3, fig. 22.

1985. *Tedania anhelans* Levi, 1963, p. 32, fig. 33; Thomas, p. 262, pl. III, fig. 1.

2002. *Tedania (Tedania) anhelans* Hooper and Van soest, P. 629, fig. 2A-F.

Material examined: P 3641/1, 4 exs., Murudeshwar, Distt, Uttara Kannada, Karnataka, 17.03.2009, Coll. M.K.Dev Roy & Party.

Description: Sponges attached on stones, 45 mm long finger like branched, surface smooth, irregular; consistency soft and fragile; colour - brick red in live; Oscule - irregularly distributed, 1-3 mm in diameter.

Skeleton : Dermal part composed of tornotes arranged irregularly and interior part composed of styles and onychaetes arranged in halichondroid pattern.

Megascleres : (1) Styles slightly curved and sharply pointed; 0.15-0.24 mm long, 0.004-0.007 mm wide, (2) Tornotes straight with oblong and minutely spined head, 0.175-0.215 mm long, 0.002-0.005 mm wide.

Microscleres: Onychaetes with unequal ends, 0.085-0.160 mm long.

Distribution: In India: Andamans, Gulf of Mannar and Palk Bay, Mincoy Island, Karnataka.

Elsewhere: Cosmopolitan.

Remarks: *Tedania (Tedania) anhelans* (Lieberkuhn, 1859) is recorded for the first time from Karnataka coast.

Order HALICHONDRIDA Gray,1867

Ceractinomorpha with styles, oxeas strongyles or intermediate spicules, of widely diverging sizes, and not funtionally localized; skeleton plumoreticulate, dendritic or confused; microscleres if present microxeas and/or trichodragmas.

Family AXINELLIDAE Carter, 1875

Halichondrida without specialised ectosomal skeleton; with velvety or microhispid surface; with choanosomal skeleton differentiated in axial (compressed or vaguely reticulated) and extra-axial (plumoreticulated) region. Megascleres are oxeas, anisoxeas, styles, sinuous strongyles in any combination. Microscleres are raphides, single or in trichodragmata.

Genus ***Axinella*** Schmidt, 1862

Definition : Axinellidae with choanosomal skeleton differentiated in axial (compressed or vaguely reticulated) and extra-axial (plumoreticulated) region. Megascleres are styles and oxeas. Microscleres, if present, are microraphides and trichodragmata.

Type species: *Axinella polypoides*, Schmidt, 1862.

5. *Axinella donnani* (Bowerbank, 1873)
(Fig. 5 a, b)

1873. *Isodictya donnani* Bowerbank, p. 28, pl. 6.

1905. *Phaketia donnani*, Dendy, p. 190.

1937. *Axinella donnani*, Burton, p. 35, pl. 6, fig. 32 ;

1970. Thomas, p. 207.

1985. Thomas, p. 289, Pl. IV, fig. 23.

Material examined: P 3653/1, 1 exs., Murudeshwar, Distt, Uttara Kannada, Karnataka, 17.03.2009, Coll. M.K. Dev Roy & Party.

Description: Sponge lamellar, surface minutely hispid, colour-yellow, texture tough, Oscules - arranged in groups, in a radiating pattern; pores scattered.

Skeleton : Axial condensation quite dense and extra axial fibres arise from the axial part in different angles. Extra axial fibres interconnected by scattered spicules or fibres in a scalariform pattern. Extra axial fibres end in the dermal brushes and plumosely arranged spicules give a characteristic appearance to the surface.

Megascleres : (1) Styles 0.20-0.45 mm long and 0.004-0.005 mm wide. (2) Oxeas 0.385-0.515 mm long and 0.007-0.008 mm wide.

Microscleres - Absent.

Distribution: In India: Gulf of Mannar, Palk Bay, Kanyakumari, Karnataka.

Elsewhere: Atlantic Ocean and Red sea.

Remarks: *Axinella donnani* (Bowerbank, 1873) is recorded for the first time from Karnataka state.

Genus ***Auletta*** Schmidt, 1870

Diagnosis : Specialized hollow tubular, branching or cylindrical growth forms, with terminal oscules; choanosomal skeleton basally condensed layer of sinuous strongyles and styles lining the endopinacoderm; radial plumo-reticulate extra-axial tracts of long styles or rhabdostyles of two sizes, embedded perpendicular to axial skeleton; these extra-axial tracts ascending towards surface in longitudinal bands, united by abundant fibres and collagenous spongin, interconnected by occasional uni-or aspicular fibres; ectosome lacks a specialized skeleton, but extra-axial spicules may piercing surface singly or in brushes.

Type species: *Auletta sycinularia* Schmidt, 1870.

6. ***Auletta elongata*** Dendy, 1905
(Fig. 6a, b&c)

1905. *Auletta elongata* Dendy, p.195, pl.13, fig.7.

1937. *Acanthella elongata* Burton, p.37, pl.7, fig.42; Thomas, 1985, p. 302, Pl. V, fig. 19.

Diagnosis: Sponges stalked with tubular branches, branches grow in bushy pattern or in one plane. Fusion, partial or complete, may also produce irregularly massive body form. Diameter of branches may vary from 4-9 mm and the thickness of the wall, 2 mm on an average. Colour, pink to orange when alive. Texture, firm but compressible

with good resliency. Oscules terminal on branches, circular and 3-5 mm in diameter. Surface minutely conulose at places, conules supported by terminal parts of main fibres.

Skeleton : Main skeleton consists of stout spicular fibres running lwngth-wise through the inner part of the wall. The extra axial fibres originate from the main fibres and end in the surface.

Megascleres :(1) Styles (2) Oxeas (3) Strongyles, Crooked

Microscleres :absent..

Distribution: In India: Gulf of Mannar and Karnataka.

Elsewhere: widely distributed in the Indian Ocean.

Remarks: This species was reported from Netrani Island, Karnataka as *Acanthella elongata* by Biodiversity Board (2007). This species is not collected during the present surveys. Diagnosis is incorporated from the literature.

Family HALICHONDRIIDAE Gray, 1867

Halichondrida with a confused arrangement of smooth oxeas and//or styles in the choanosome and usually an organised special ectosomal skeleton consisting of tangentially arranged or densely confusedly arranged crust of oxeas and/or styles of sizes similar to or smaller than those of the choanosome.

Genus ***Axinyssa*** Lendenfeld, 1897

Halichondriidae lacking an ectosomal tangential skeleton. Choanosomal skeleton largely disorganized, but at the periphery the spicules are arranged in bundles at rioght angles to and protruding slightly beyond the surface causing a fine conulation.

Type species: *Axinissa topsenti* Lendenfeld, 1897.

7. ***Axinyssa flabelliformis*** (Keller)
(Fig. 7)

1905. *Acanthella flabelliformis,* Dendy, p. 193.

1937. *Axinella flabelliformis,* Burton, p. 36.

1936. *Axinyssa flabelliformis* de Laubenfels, p. 163.

1985. *Axinyssa flabelliformis,* Thomas, p. 329, pl. IV, fig. 39.

Diagnosis: Sponges flabellate, stipitate; Colour, blue black in live; Texture, firm but compressible and resilient. Surface with longitudinal ridges and form conules at some places. Oscules very small present in between the ridges.

Skeleton: sub-isodictyal reticulation of spopngin fibres filled with oxeas, sometimes plumosely arranged.

Megascleres : (1) Oxeas size up to 0.3 x 0.05 mm.

Microscleres : absent.

Distribution: In India: Gulf of Mannar and Karnataka.

Elsewhere: Red Sea.

Remarks: This species was reported from Netrani Island, Karnataka as *Axinysria flabelliformes* by Biodiversity Board (2007). This species is not collected during the present surveys. Diagnosis is incorporated from the literature.

Order HAPLOSCLERIDA Topsent, 1928

Demospongiae in which the main skeleton is partially or entirely composed of an isodictyal anisotropic or isotropic, ocassionally alviolate riticulation of spongin fibres and or spicules, with uni- to multispicular tracts of diactinal spicules forming triangular, rectanglar or polygonal meshes. Megascleres are exclusively oxeote or strongylote, microscleres, if present, may include sigmas and/ or smooth toxas (both frequently centrangulate), microxeas or microstrongyles, and in one group amphidiscs.

Suborder HAPLOSCLERINA Topsent, 1928

Marine haplosclerida with a anisotropic choanosomal skeleton; spicules smooth oxeas or strongyles of a single category.

Family CALLYSPONGIIDAE de Laubenfels

Haplosclerida with two dimensional ectosomal

skeleton of primary, secondaryand sometimes tertiary spongin fibres, fibres are cored by oxeas or strongyles, occasionally uncored or cored with foreign material.

Genus ***Callyspongia*** Duchassaing & Michelotti, 1864

Callypsospongiidae with a regular ectosomal tangential reticulation of primary, secondary and sometimes tertiary spiculo-fibres, ectosomal morphology; one single size or three sizes of rounded to irregular, or triangular to rectangular ectosomal mesh. Spongin abundant. Microscleres toxas may be present (e.g., *Callyspongis (Toxochalina) multiformis* Pulitzer-Finali, 1986).

Type species: *Callyspongia fallax* Duchassaing & Michelotti, 1864.

Subgenus ***Cladochalina*** Schmidt, 1870

Callyspongia with ectosomal network with three sizes of mesh around terminal ends of primary fibres largely spread on the surface. Multispicular primary fibres well defined, always fasciculated, and ramified to form a choanosomal tertiary network of fine fibres always present. Spongin sheath clearly visible. Conulose surface.

Type species: *Tuba armigera* Duchassaing & Michelotti, 1864.

8. ***Callyspongia (Cladochalina) diffusa*** Ridley, 1884
(Fig. 8)

1884 . *Callyspongia diffusa* Ridley, p. 183; Burton, 1934, p. 541; Burton, 1937, p. 20; Rao, 1941, p. 432, Pl. Xii, fig. 14.

2002. *Callyspongia (Cladochalina) diffusa* Hooper and Van soest, p. 841 (subgenus asignment).

Material examined: P3648/1, 2 ex Murudeshwar, Karnataka, 17.03.2009, Coll. M.K. Dev Roy & Party.; P3649/1, 5 ex., St. Merry Island, Karnataka, 24. 03. 2010, Coll. J.G. Pattanayak & Party.

Description: Sponge flabellate, fan-shaped, compressible, resilient, colour-pale brown, Oscules - 2-5 mm diameter, present on funnel shaped processes on upper surface of the sponge.

Skeleton : Dermal and primary skeleton fibres are well developed with spongin fibres.

Megascleres : Oxeas 0.070-0.075 mm long and 0.004 mm wide.

Microscleres : absent.

Distribution: In India: Pamban, Gulf of Mannar, Kanyakumari and Karnataka.

Elsewhere: Trincomalee, Ceylon.

Remarks: Callyspongia (Cladochalina) diffusa Ridley, 1884 is recorded for the first time from Karnataka coast.

9. ***Callyspongia (Cladochalina) fibrosa*** Ridley & Dendy, 1886
(Fig. 9)

1886. *Callyspongia fibrosa* Ridley & Dendy, p; Thomas, 1985, p. 248, Pl. II, fig. 14.

1905. *Pachychalina spinilamella*, Dendy, p. 149, pl. 7, fig. 4.

1930. *Sclerochalina spinilamella*, Burton, p. 669.

2002. *Callyspongia (Cladochalina) fibrosa*, Hooper and Van Soest, p.258 (subgenus).

Material examined: P3646/1, 12 ex., St. Merry Island, Karnataka, 24. 03. 2010, Coll. J.G. Pattanayak & Party; P3647/1, 4 ex., Murudeshwar, Karnataka, 17. 03. 2009, Coll. M.K. Dev Roy & Party.

Description: Sponge flattened branched, connules on the surface and prominent at growing tips, colour-pale yellow in live; Oscules - irregularly distributed, rounded or elliptical, 3 mm in diameter.

Skeleton : Dermal skeleton reticulate, main skeleton formed of primaries and connectives.

Megascleres : Oxeas straight or slightly curved 0.075-0.105 mm long and 0.002-0.004 mm wide.

Microscleres : Absent.

Distribution: In India: Gulf of Mannar, Palk Bay; Kodikkarai, Tamilnadu; Murudeshwar, St. Merry Island, Karnataka.

Elsewhere: Indo-Australian region.

Remarks: Callyspongia (Cladochalina) fibrosa Ridley & Dendy, 1886 is recorded for the first time from Karnataka coast.

Family CHALINIDAE Gray, 1867

Definition : Haplosclerena with a delicate reticulated choanosomal skeleton of uni-, pauci- or multispicular primary lines, which are regularly connected by unispicular secondary lines. Ectosomal skeleton, if present, a regularly hexagonal, unispiocular, tangential reticulation.

Genus ***Haliclona*** Grant, 1836

Defination : Chalinidae with unispicular secondary lines.

Subgenus ***Haliclona*** Grant, 1836

Choanosomal skeleton consisting of a very regular, ladder-like reticulation of uni- to paucispicular primary lines, regularly connected by unispicular secondary lines. Ectosomal skeleton, if present, a unispicular, tangential, isotropic reticulation; ocassionally with the oxeas 'intercrossing'. Oxeas short, rather robust, fusiform or with acerated points. Spongin moderate to abundant. No microscleres.

Type species : *Haliclona oculata* (Pallas, 1766).

10. ***Haliclona (Haliclona) oculata*** (Pallas, 1766) (Fig. 10 a, b)

1766. *Spongia oculata* Pallas,

1941. *Haliclona oculata* Rao, p. 428.

2002. *Haliclona (Haliclona) oculata* De Weerdt, W.H. p.852.

Material examined: P3644/1, 2 ex., Murudeshwar, Karnataka, 20.03.2010, Coll. J.G. Pattanayak.

Description: Sponge consists of several short tubes arising from a basal mass. Consistency soft and spongy. Surface hispid; Colour gray; oscules - terminal and elevated, diameter, 3mm.

Skeleton : Irregular reticulation of multiserially cored fibers, main fibers are distinct from connectives.

Megascleres : Oxeas, 0.08-0.12 mm long and 0.004-0.006 mm wide.

Microscleres : Absent.

Distribution: In India: Gulf of Mannar, Kodikkarai, Murudeshwar, Karnataka.

Elsewhere: Atlantic Ocean, Red Sea, Pacific Ocean, Arctic.

Remarks. Haliclona (Haliclona) oculata (Pallas, 1766) is recorded for the first time from Karnataka coast.

Subgenus ***Gellius*** Gray, 1867

Chalinidae with a choanosomal skeleton sonsisting of a rather confused, subhalichondroid reticulation of pauci- to multispicular primary lines, irregularly connected unispicular secondary lines. Ectosomal skeleton, if present either a regular, tangential, unispicular, isotrop[ic reticulation, or consisting of irregularly strewn, tangentially orientated spicules.

Type species: *Isodictya jugosa* Bowerbank, 1866.

11. ***Haliclona (Gellius) cellaria*** (Rao, 1941) (Fig. 11)

1941. *Callyspongia cellaria* var *fusca* Rao, p. 437, Pl. XII, fig. 8 and 9.

2012. *Haliclona (Gellius) cellaria*, Van Soest RWM *et al.*

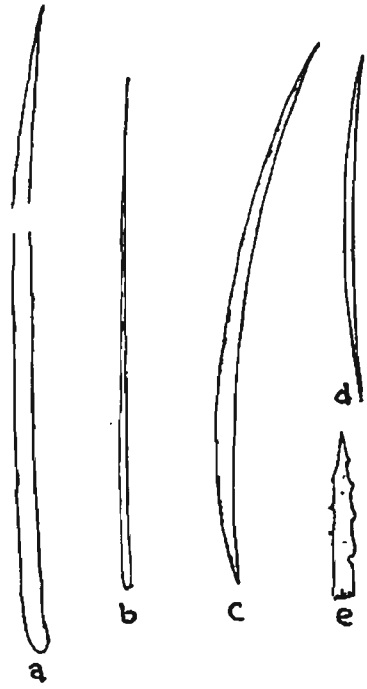
Material examined: P3640/1, 1 ex., St. Merry Island, Dt. Udipi, Karnataka, Shore collection, 24. 03. 2010, Coll. J.G. Pattanayak & Party; P3642/1, 1 ex., St. Merry Island, Dt. Udipi, Karnataka, Shore collection, 24. 03. 2010, Coll. J.G. Pattanayak & Party; P3645/1, 10 ex., St. Merry Island, Dt. Udipi, Karnataka, Shore collection, 24. 03. 2010, Coll. J.G. Pattanayak & Party.

Description: Sponge clathrous, attached on mollusk shells and rocks, texture less firm and slightly compressible, colour-dark brown, Oscules - numerous 5-7 mm in diameter.

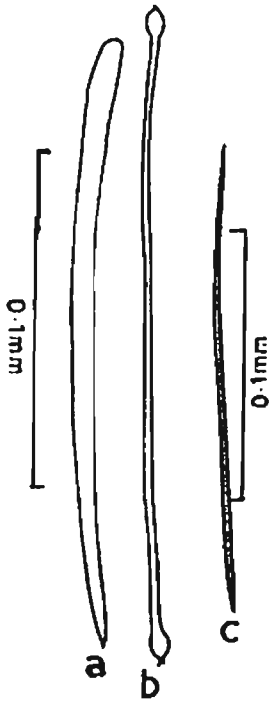
Skeleton: Dermal reticulation of spicular fibres formed of one or more spicules, spicular fibres

1. *Suberites carnosus*
a & b tylostyle

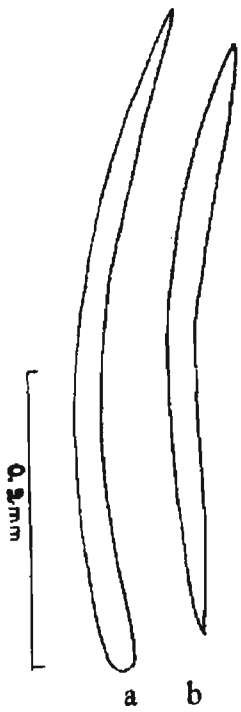
2. *Endectyon (Endectyon) hornelli*
a. long style b. small style
c. Oxea d. Acanthostyle



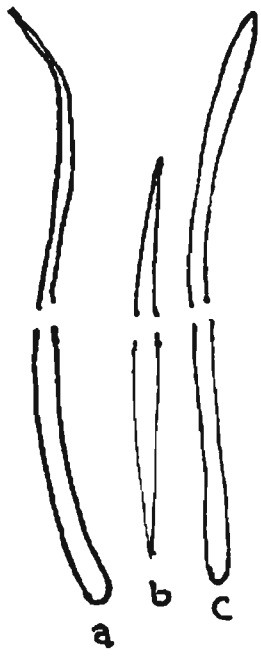
3. *Echinodictyum longistylum*
a. long style b. hair-like style
c. Oxea d. small oxea
e. Acanthostyla



4. *Tedania (Tedania) anhelans*
a. style b. tornote c. onychaete

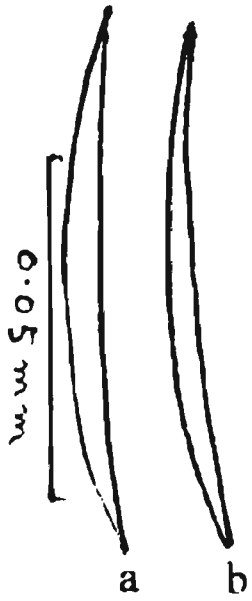


5. *Axinella donnani*
a. style b. oxea

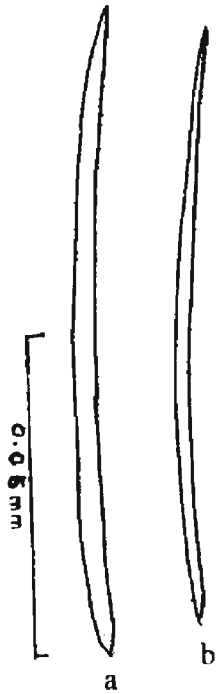


6. *Auletta elongata*
a. style b. Oxea
c. strongyle

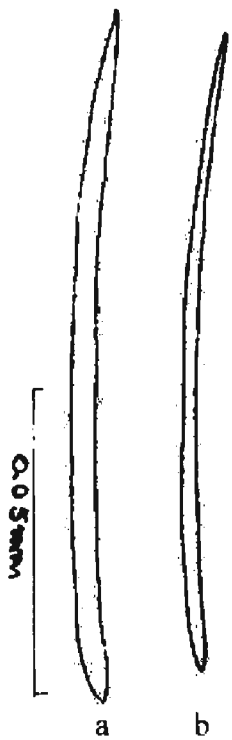
7. *Axinyssa flabelliformis*
oxeas



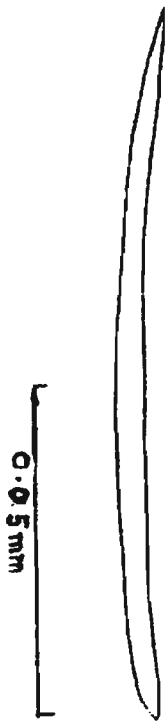
8. *Callyspongia (Cladochalina) diffusa*
oxeas



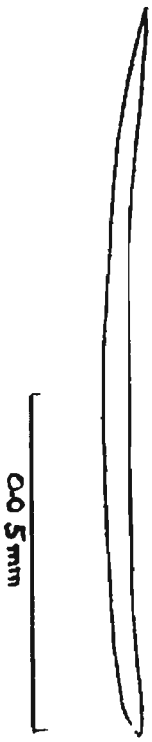
9. *Callyspongia (Cladochalina) fibrosa*
Oxeas



10. *Haliclona (Haliclona) oculata*
a, b. Oxeas



11. *Haliclona (Gellius) cellaria*
Oxea



12. *Amphimedon chloros*
Oxea

relatively thin and form a circular or polydgonal reticulation.

Megascleres : Oxeas straight or curved, 0.10-0.22 mm long and 0.012-0.014 mm wide.

Microscleres : absent.

Distribution: In India: Gulf of Mannar, Kodikkarai and Karnataka.

Remarks: Haliclona (Gellius) cellaria (Rao, 1941) is recorded for the first time from Karnataka coast.

Family NIPHATIDAE Van Soest, 1980

Definition : Haplosclerida with three dimensional ectosomal skeleton of multispicular fibres. Choanosomal skeleton of multispicular fibres, cored by oxeas, often strongylote or stylote. Microscleres if present, sigmas or microxeas.

Genus ***Amphimedon*** Duchassaing & Michelotti, 1864

Smooth surface, regular tangential ectosomal network with rounded meshes of a single size. Ends of choanosomal longitudinal primary fibres barely protruding. Spongin abundant. Microscleres absent.

12. ***Amphimedon chloros*** Ilan, Gugel & van Soest, 2004
(Fig. 12)

1937. *Hemihaliclona viridis* Burton, p. 18.

1985. *Haliclona viridis,* Thomas, p. 232, pl. I, fig. 21

2004. *Amphimedon chloros* Ilan, Gugel & van Soest.

Material examined: P3650/1, 2 ex., Murudeshwar, Karnataka, 17. 03. 2009, Coll. M.K. Dev Roy & Party; P3651/1, 2 ex., Gokarna main beach, Dt. Uttar Kannada, Karnataka, 15. 03. 2010, Coll. J.G. Pattanayak & Party; P3652/1, 23 ex., Murudeshwar, Karnataka, 17. 03. 2009, Coll. M.K. Dev Roy & Party.

Description: Sponge massive, digitately branched, attached on rocks, texture soft and spongy, colour-green in live, surface hispid; Oscules - numerous 5-7 mm in diameter.

Skeleton : A branching system of horny fibres cored by oxeas.

Megascleres : Oxeas straight or curved, 0.10-0.25 mm long and 0.005-0.012 mm wide.

Microscleres : absent.

Distribution: In India: Gulf of Mannar and Karnataka.

Remarks: Amphimedon chloros Ilan, Gugel & van Soest, 2004 is recorded for the first time from Karnataka coast.

SUMMARY

The present paper deals with the diagnostic features of 12 species of marine sponges available in the coast of Karnataka State of which 8 species are new record from Karnataka coast.

ACKNOWLEDGEMENTS

The authors wish to express their deep felt gratitude and thanks to Dr. K. Venkatraman, Director, Zoological Survey of India, Kolkata, for providing facilities to complete this work. All staffs of General Non- Chordata section and Publication Division of Zoological Survey of India also acknowledged for their sincere help.

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Dendy, A., 1905. Report on the sponges collected by Prof. Herdman, at Ceylon, in 1902. *Report to the Government of Ceylon on the Pearl Oyster Fisheries of the Gulf of Mannar, Royal Society, London,* suppl. **3**(18) : 57-246.

Dendy, A., 1916. Report on the non-calcareous sponges collected by Mr. James Hornell at Okhamandal in Kattiawar in 1905-1906. *Report of Government of Baroda on the Marine Zoology of Okhamandal,* Ser. 2, **17** : 93-146, pls. 1-4.

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Rao, H.S., 1941. Indian & Ceylon sponges in the naturalistoriska Riksmuseet, Stockholm, collected by K.Fistedt. *Records of the Indian Museum, Calcutta*, **43** : 417-496.

Thomas, P.A., 1979. Demospongiae of Minicoy Island (Indian Ocean) Part-I, orders keratosida and Haplosclerida. *Journal of the Marine Biological Association of India,* **21**(1 & 2) : 10-16.

Thomas, P.A., 1980. Demospongiae of Minicoy Island (Indian Ocean) Part-II order Poecilosclerida. *Journal of the Marine Biological Association of India,* **22**(1 & 2) : 1-7.

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Zool. Surv. India
Fauna of Karnataka, State Fauna Series, 21 : 21-31, 2013

MOLLUSCA : FRESHWATER GASTROPODS

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Zoological Survey of India, Southern Regional Centre, Chennai–600 028

INTRODUCTION

Karnataka state with an area of 76,245 sq. km is situated on the western edge of the Deccan plateau and stretches from 11.5N to 19N latitude and from 74E to 78.6E longitude. The main rivers of the south originate from western ghats, namely Cauvery, Thunghabhadra and Krishna. The districts surveyed were Bangalore, Chickmagalur, Dakshinkannad, Hassan, Kodagu, Kolar, Mandya, Mysore, Udipi besides Biligiri Rangaswamy Temple sanctuary and Bannerghatta National Park.

SYSTEMATIC LIST

Phylum MOLLUSCA

Class GASTROPODA

Order MEGAGASTROPODA

Family NERITIIDAE

Genus ***Neritina*** Lamarck, 1816

1. *Neritina (Dostia) violacea* (Gmelin, 1791)

Family VIVIPARIDAE

Subfamily BELLAMYINAE

Genus ***Bellamya*** Jousseaume, 1886

2. *Bellamya bengalensis* (Lamarck, 1882)
3. *Bellamya dissimilis* (Mueller, 1774)

Family PILIDAE

Genus ***Pila*** (Bolten) Roeding, 1798

4. *Pila globosa* (Swainson, 1822)

4a. *Pila globosa* var. *minor* Nevill, 1877

5. *Pila virens* (Lamarck, 1822)

Family BITHYNIIDAE

Subfamily BITHYNIINAE

Genus ***Gabbia*** Tyron

6. *Gabbia alticola* (Annandale, 1918)
7. *Gabbia stenothyroides* (Dohrn)
8. *Gabbia travancorica* (Benson, 1860)

Genus ***Digoniostoma*** Annandale, 1920

9. *Digoniostoma pulchella* (Benson, 1836)

Subfamily MYSORELLINAE

Genus ***Mysorella*** Godwin-Austen, 1919

10. *Mysorella costigera* (Kuester, 1852)

Family STENOTHYRIDAE

Genus ***Stenothyra*** Benson, 1856

11. *Stenothyra blanfordiana* Nevill, 1880

Family THIARIDAE

Subfamily THIARINAE

Genus ***Thiara*** Roeding, 1786

12. *Thiara (Thiara) scabra* (Mueller, 1774)
13. *Thiara (Stenomelania) punctata* (Lamarck, 1822).
14. *Thiara (Tarebia) lineata* (Gray, 1828)
15. *Thiara (Melanoides) tuberculata* (Mueller, 1774)

Subfamily MELANATRIINAE

Genus ***Sulcospira*** Troschel, 1858

16. *Sulcospira huegeli* (Philippi, 1841)

Genus ***Brotia*** H. & A. Adams, 1866

17. *Brotia (Antimelania) costula* (Rafinesque, 1833)

Subfamily PALUDOMINAE

Genus ***Paludomus*** Swainson, 1840

18. *Paludomus (Paludomus) annandalei* Preston, 1909.
19. *Paludomus (Paludomus) tanschauricus* (Gmelin, 1771).
20. *Paludomus (Stomatodon) stomatodon* Benson. 1862.

Subclass PULMONATA

Order BASOMMATOPHORA

Family LYMNAEIDAE

Genus ***Lymnaea*** LamarcK, 1799

21. *Lymnaea (Pseudosuccinea) acuminata* Lamarck. 1822

21. (a) *Lymnaea (Pseudosuccinea) acuminata* f. *rufescens* Gray, 1820

21. (b) *Lymnaea (Pseudosuccinea) acuminata* f. *typica* Lamarck, 1822

21. (c). *Lymnaea (Pseudosuccinea) acuminata* f. *gracilior* Martens, 1881

22. *Lymnaea (Pseudosuccinea) biacuminata* Anandale and Rao, 1925

23. *Lymnaea (Pseudosuccinea) luteola* Lamarck, 1822

23. (a). *Lymnaea (Pseudosuccinea) luteola* f. *typica* Lamarck, 1822

23. (b). *Lymnaea (Pseudosuccinea) luteola f.impura* Troschal, 1837

23. (c). *Lymnaea (Pseudosuccinea) luteola* f. *ovalis* Gray, 1822

23. (d). *Lymnaea (Pseudosuccinea) luteola* f. *australis* Anandale and Rao, 1925

24. *Lymnaea (Pseudosuccinea) ovalior* Anandale and Prashad.

Family ANCYLIDAE

Genus ***Ferrissia*** Walker, 1903

25. *Ferrissia tenuis* (Bourguignat, 1862)
26. *Ferrissia verruca* (Benson, 1855)

Family PLANORBIDAE

Subfamily BULININAE

Genus ***Indoplanorbis*** Annandale and Prashad

27. *Indoplanorbis exustus* (Deshayes)

Subfamily SEGMENTINAE

Genus ***Segmentina*** Flemming, 1817

28. *Segmentina (Polypylis) trochoidea* (Benson, 1836)

Subfamily PLANORBINAE

Genus ***Gyraulus*** Charpentier

29. *Gyraulus convexiusculus* (Hutton)

SYSTEMATIC ACCOUNT

Phylum MOLLUSCA

Class GASTROPODA

Order MEGAGASTROPODA

Family NERITIIDAE

Genus ***Neritina*** Lamarck, 1816

1. ***Neritina (Dostia) violacea*** (Gmelin, 1791)

1791. *Neritina violacea* (Gmelin). *Syst. Nat., ed.* **13** : 3686

1989. *Neritina (Dostia) violacea* (Gmelin). Subba Rao. Hand book : Freshwater molluscs of India. p. 37-38.

1992. *Neritina (Dostia) violacea* (Gmelin). *Fauna of west Bengal State Fauna series,* **3**(9) : 10.

Material : Not collected.

Diagnostic Characters : Occurs mostly in brackish water.

Distribution : Andaman Islands; Andhra Pradesh; Goa; Gujarat; Kerala; Karnataka; Orissa; Tamilnadu and West Bengal.

Family VIVIPARIDAE

Subfamily BELLAMYINAE

Genus ***Bellamya*** Jousseaume, 1886

2. ***Bellamya bengalensis*** (Lamarck, 1882)

1882. *Paludima bengalensis* Lamarck. *Hist. Nat. Anim. Sans. Vert.* **6**(2) : 174

1989. *Bellamya bengalensis* Lamarck. Subba Rao. Hand book, Freshwater Molluscs of India p. 45-47.

Material : 24 exs, Andhra Pradesh; 141 exs Karnataka; 57 exs, Kerala; 22 exs, Pondicherry; 123 exs, Tamilnadu.

Diagnostic Characters : Shell thin, smooth with three colour bands.

Distribution : Common throughout India.

Morphometric Measurements : Length : 28.1 mm; Width : 17.2 mm; Height : 14.4 mm.

Other work : Bio accumulation of heavy metals were studied by Gupta and Banerjee (1998), and studies pertaining to seasonal variation in reproductive potentiality were made by Panigrahi, (1998).

3. ***Bellamya dissimilis*** (Mueller, 1774)

1774. *Nerita dissimilis* Mueller. *Hist. Verm. Test* pt. **2** : 184

1989. *Bellamya dissimilis* Mueller. Subbarao. Hand book, Freshwater Molluscs of India, p. 48-49.

1989. *Bellamya dissimilis* Mueller. *Fauna of Orissa State Fauna series,* P. 286-288.

1992. *Bellamya dissimilis* Mueller. *Fauna of west Bengal State Fauna series,* **3**(9) : 14.

1997. *Bellamya dissimilis* Mueller.*Fauna of Delhi State fauna series*, **6** : 114.

2004. *Bellamya dissimilis* Mueller. *Zool. Surv. India. Conservation Area Series* **20** : *Fauna of Pench National Park,* P. 145.

Material : 2 exs, Tamilnadu.

Diagnostic Characters : Shell smaller without spiral bands, suture deeply impressed.

Distribution : Penisular, Northern India and West Bengal.

Morphometric Measurements : Length : 20.5mm; Width : 14.3 mm; Height : 10.7 mm.

Family PILIDAE

Genus ***Pila*** (Bolten) Roeding, 1798

4. ***Pila globosa*** (Swainson, 1822)

1822. *Ampullaria globosa* Swainson. *Zool. Illustrations.* **Vol. 2**. pl cxix.

1989. *Pila globosa* Swainson. Subba Rao. Hand book, Freshwater Molluscs of India p. 58.

1992. *Pila globosa* Swainson. *Fauna of West Bengal State Fauna series,* **3**(9) : 15.

2004. *Pila globosa* Swainson. *Zool. Surv. India. Conservation Area Series,* **20** : *Fauna of Pench National Park,* P. 146.

Material : 17 exs, Andhra Pradesh; 69 exs, Karnataka; 18 exs, Kerala; 164 exs, Tamilnadu.

Previous Studies : Detailed studies made on this species with references to reproductive processes, development, structure of heart, nervous system, biology, anatomy and physiology. Studies pertaining to density, biomass, secondary productivity by Singh (1990)and shell structural support againstdamage were made by Panigrahi (1999).

Distribution : Maharashtra, Madhya Pradesh, Uttar Pradesh, Bihar, West Bengal, Orissa and Assam. Eventhough Subba Rao shows distribution only in North India except Punjab and Himachal Pradesh. This species is available from Tamilnadu, Andhrapradesh and Karnataka.

Morphometric Measurements : Length : 50.61 mm; Width : 44.9 mm; Height : 36.8 mm.

4. (a) ***Pila globosa* var. *minor*** Nevill, 1877

1877. *Ampullaria globosa* var. minor Nevill, *Hand list Moll. Indian Mus.*, pt. **2** : 4.

1992. *Pila globosa* var. *minor* Nevill. *Fauna of West Bengal, State Fauna series,* **3**(9) : 15-16.

Material : 1 ex, Karnataka; 1 ex, Tamilnadu

Diagnostic Characters : Variety *minor* and variety *incrassatula* reported.

Distribution : *Pila globosa* var. *minor* has been reported only from Kolkata, West Bengal but recorded for the first time from Tamilnadu.

Morphometric Measurements : Length : 29.4 mm; Width : 25.9 mm; Height : 22.2 mm.

5. ***Pila virens*** (Lamarck, 1822).

1822. *Ampullaria virens* Lamarck. *Hist. Nat.anim. Sans. Ver.* **6**(2) :179.

1989. *Pila virens* Lamarck. Subba Rao. Hand book, Freshwater Molluscs of India p. 60-61.

2004. *Pila virens* Lamarck. *Zool. Surv. India. Conservation Area Series,* **20** : *Fauna of Pench National Park,* P. 146.

Material : 6 exs, Andhra Pradesh; 28 exs, Karnataka; 4 exs Pondicherry.

Diagnostic Characters : Variable in colour and shape of the spine.

Other work : Physiology especially pertaining to aestivation was investigated by Meenakshi (1951, 54, 55a-c, 1956a-c, 1957, 1964) Ramamoorthy (1955, 1958a, d 1959a,b, 1960) Shylaja and Alexander (1975).

Distribution : Common species in South India and Maharashtra.

Morphometric Measurements : Length : 16.4 mm; Width : 12.5 mm; Height : 10.9 mm.

Family BITHYNIIDAE

Subfamily BITHYNIINAE

Genus ***Gabbia*** Tyron

6. *Gabbia alticola* (Annandale, 1918)

1918. *Amnicola alticola* Annadale. *Rec. Indian Mus.*, **14** : 122. pl.xiv. figs 6, 6a.

1989. *Gabbia alticola* Annandale. Subba Rao. Handbook, Freshwater Molluscs of India, p. 78

Material : 76 exs, Karnataka; 6 exs, Tamilnadu.

Diagnostic Characters : Shell sculptured with longitudinal striae.

Distribution : After the first description from Myanmar recorded from Karnataka and Tamilnadu and New record for India.

Morphometric Measurements : Length : 21.9 mm; Width : 18.6mm; Height : 18 mm.

7. ***Gabbia stenothyroides*** (Dohrn)

1857. *Bithini stenothyroides* Dohrn. *Proc. Zool. Soc. London*, p. 123.

1989. *Gabbia stenothyroides* (Dohrn). Subba Rao. Handbook, Freshwater Molluscs of India, p. 77.

Material : 16 exs, Karnataka.

Diagnostic Characters : Shell ovate, body whorl larger, spire short.

Distribution : Maharashtra, Tamilnadu and also Karnataka.

Morphometric Measurements : Length : 5.1 mm; Width : 4.3 mm; Height : 3.7 mm.

8. ***Gabbia travancorica*** (Benson, 1860)

1860. *Bithynia travancorica* Benson. *Ann. Mag. Nat. Hist.*, **6**(3) : 259.

1989. *Gabbia travancorica* (Benson). Subba Rao. Hand book, Freshwater Molluscs of India p. 78.

Material : Not collected.

Diagnostic Characters : Shell conically globose, aperture oval.

Distribution : Andhra Pradesh; Kerala. Type locality : Quilon, Kerala.

Genus ***Digoniostoma*** Annandale, 1920

9. ***Digoniostoma pulchella*** (Benson, 1836)

1836. *Paludima pulchella* Benson. *J. Asiat, Soc. Beng.*, **5** : 746.

1989. *Digoniostoma pulchella* (Benson). Subba Rao. Handbook, *Freshwater Molluscs of India*, p. 80.

1992. *Digoniostoma pulchella* (Benson). *Fauna of West Bengal, State Fauna series*, **3**(9) : 16-17.

1997. *Digoniostoma pulchella* (Benson). *Fauna of Delhi, State fauna series*, **6** : 115.

2003. *Digoniostoma pulchella* (Benson). *Zool. Surv. India. Wetland Ecosystem series* **5** : *Fauna of Asan Wetland*, P. 20.

2004. *Digoniostoma pulchella* (Benson). *Zool. Surv. India. Conservation Area Series*, **20** : *Fauna of Pench National Park*, P. 145.

Material : Not collected.

Diagnostic Characters : Shell elongate, spire longer, sutures depressed.

Distribution : Throughout India.

Subfamily MYSORELLINAE

Genus ***Mysorella*** Godwin-Austen, 1919

10. ***Mysorella costigera*** (Kuester, 1852)

1852. *Paludina costigera* Kuester. In Martín & Chemnitz, *Syst. Conch. Cab.*, **1**(21) : 33 pl. 7, figs. 18, 19.

1989. *Mysorella costigera* (Kuester). Subba Rao. Handbook, Freshwater Molluscs of India, p. 84.

Material : Not collected.

Diagnostic Characters : Shell with 5 spiral ridges, with horny brown colour.

Distribution : Tamilnadu; Pondicherry; Karnataka.

Family STENOTHYRIDAE

Genus ***Stenothyra*** Benson, 1856.

11. ***Stenothyra blanfordiana*** Nevill, 1880

1880. *Stenothyra blanfordiana* Nevill. *J. Asiat. Soc. Bang.*, **49**(2) : 160.

1989. *Stenothyra blanfordiana* Nevill. Subba Rao. Handbook, Freshwater Molluscs of India, p. 87.

1989. *Stenothyra blanfordiana* Nevill. *Fauna of Orissa, State Fauna series,* **1**(2) : 291.

Material : 2 exs, Karnataka.

Diagnostic Characters : Shell subventricose, whorls spire not elongated.

Distribution : West Bengal, Orissa and Tamilnadu. During the present study collected from Karnataka and a new report for Karnataka.

Morphometric Measurements : Length : 28.4 mm; Width : 17.6 mm; Height : 13.4 mm.

Family THIARIDAE

Subfamily THIARINAE

Genus ***Thiara*** Roeding, 1786

12. ***Thiara (Thiara) scabra*** (Mueller, 1774)

1774. *Buccinum scabra* Mueller. *Hist. Verm. Terr. Flur.*, **2** : 136.

1989. *Thiara (Thiara) scabra* (Mueller). Subba Rao. *Handbook, Freshwater Molluscs of India,* p. 96-97.

1989. *Thiara (Thiara) scabra* (Mueller). *Fauna of West Bengal, State Fauna series,* **3**(9) : 19.

2002. *Thiara (Thiara) scabra* (Mueller). *Zool. Surv. India. Wetland Ecosystem series*, **3** : *Fauna of Ujani,* P. 137-138.

2003. *Thiara (Thiara) scabra* (Mueller). *Zool. Surv. India. Wetland Ecosystem series*, **5** : Fauna of Asan Wetland. P. 20.

2004. *Thiara (Thiara) scabra* (Mueller). *Zool. Surv. India. Conservation Area Series*, **20** : *Fauna of Pench National Park,* P. 146 147.

Material : 17 exs., Andhra Pradesh; 400 exs., Karnataka; 18 exs., Kerala; 23 exs., Pondicherry; 146 exs., Tamilnadu.

Diagnostic Characters : Sutures distinct, whorls with spires.

Other work : Studies pertaining to Breeding biology, physiology were carried out by Mulay (1975-78), Mulay and Naghabhusanam (1975, 1977).

Distribution : Throughout India.

Morphometric Measurements : Length : 20.9 mm; Width : 8.2 mm; Height : 9.9 mm.

13. ***Thiara (Stenomelania) punctata*** (Lamarck, 1822)

1822. *Melania punctata* Lamarck, *Hist Nat. Anim. Sans. Vert.* **6**(2) : 165.

1989. *Thiara (Stanomelania) punctata (Lamarck).* Subba Rao. Handbook, *Freshwater Molluscs of India,* p.96-97.

Material : 1 ex, Karnataka.

Diagnostic Characters : Shell turret elongated, operculum horny.

Distribution : Throughout India.

Morphometric Measurements : Length : 44.0 mm; Width : 13.3 mm; Height : 12.6 mm.

14. ***Thiara (Tarebia) lineata*** (Gray, 1828)

1828. *Helix lineata* Gray, *in Wood's index Text. Suppl.* P. 24, fig. 68.

1989. *Thiara (Tarebia) lineata* (Gray). Subba Rao. *Hand book, Freshwater Molluscs of India* p. 102.

1989. *Thiara (Tarebia) lineata* (Gray), *Fauna of Orissa, State Fauna series*, **1**(2) : 294-296.

1992. *Thiara (Tarebia) lineata* (Gray). *Fauna of West Bengal, State Fauna Series,* **3**(9) : 20.

2002. *Thiara (Tarebia) lineata* (Gray). *Zool. Surv. India. Wetland Ecosystem Series,* **3** : *Fauna of Ujani,* P. 138.

2004. *Thiara (Tarebia) lineata* (Gray). *Zool. Surv. India. Conservation Area Series,* **20** : *Fauna of Pench National Park,* P. 147.

Material : 2 exs, Karnataka.

Diagnostic Characters : This species was synonymised with *Thiara granifera* (Lamarck) or treated as its variety (Van Benthem Jutting, 1956). But It is readily distinguished from the former by the absence of rows of nodules and presence of distinct dark spiral lines.

Other work : Studies on the effect of pesticide ragor on biochemical constituents were made by Chaudhuri *et al.* (1999).

Distribution : Earlier it was recorded from west Bengal, Bihar, Madhya Pradesh, Uttar Pradesh, Maharshtra, Assam and presently it is recorded from Karnataka.

Morphometric Measurements : Length : 12.6 mm; Width : 6.3 mm; Height :12.5 mm.

15. ***Thiara (Melanoides) tuberculata*** (Mueller, 1774)

1774. *Neretia tuberculata* Mueller. *Hist. Verm. Terr. Fluv.*, **2** : 191

1989. *Thiara (Melanoides) tuberculata* (Mueller). Subba Rao. *Handbook, Freshwater Molluscs of India,* p. 103-105.

1989. *Thiara (Melanoides) tuberculata* (Mueller). *Fauna of Orissa, State Fauna Series,* **1**(2) : 293-294.

1992. *Thiara (Melanoides) tuberculata* (Mueller). *Fauna of West Bengal, State Fauna Series*, **3**(9) : 19-20.

1997. *Thiara (Melanoides) tuberculata* (Mueller). *Fauna of Delhi, State Fauna Series,* **6** : 116

2000. *Thiara (Melanoides) tuberculata* (Mueller). *Zoological Survey of India, Wetland Ecosystem Series,* **2** : *Fauna of Renuka Wetland,* p. 19

2002. *Thiara (Melanoides) tuberculata* (Mueller). *Zool. Surv. India. Wetland Ecosystem Series*, **3** : *Fauna of Ujani,* P. 138-139.

2003. *Thiara (Melanoides) tuberculata* (Mueller). *Zool. Surv. India. Wetland Ecosystem series*, **5** : *Fauna of Asan Wetland,* P. 20.

2004. *Thiara (Melanoides) tuberculata* (Mueller). *Zool. Surv. India. Conservation Area Series*, **20** : *Fauna of Pench National Park,* P. 147-148.

Material : 36 exs, Karnataks; 47 exs, Tamilnadu; 2 exs, Andhrapradesh.

Diagnostic Characters : Shell with a high spire and moderately large body whorl.

Other studies : Growth indices (Agarwal, 1994) (Dhanumkumari *et al.*). Preference of substratum (Annapurna and Bhavanarayana 1993). Seshayya (1936), Ramamoorthi (1950, 1955) Jacobe (1959a, b), Subbarao and Mitra (1982) studied the biology. Berry and Kadri (1974) investigated on reproduction.

Distribution : Throughout India except Kashmir.

Morphometric Measurements : Length : 22.2 mm; Width : 8.5 mm; Height : 7.7 mm.

Subfamily MELANATRIINAE

Genus ***Sulcospira*** Troschel, 1858

16. ***Sulcospira huegeli*** (Philippi, 1841)

1841. *Melania huegeli Philippi*. Abbild, *Beschreib. Conch.*, 1 : 61, pl. 2, fig.8.

1989. *Sulcospira huegeli* (Philippi) Subba Rao. *Hand book, Freshwater Molluscs of India,* p. 107.

Material : 5 exs, Pondicherry; 174 exs, Karnataka.

Diagnostic Characters : Shell ovoid conical, whorls 5-6, regularly increasing in size.

Distribution : Assam, Karnataka, Kerala and also Pondicherry.

Morphometric Measurements : Length : 47.3 mm; Width : 20.0 mm; Height : 20.9 mm.

Genus ***Brotia*** H. & A. Adams, 1866

17. ***Brotia (Antimelania) costula*** (Rafinesque, 1833)

1833. *Melania costula* Rafinesque. *Atlantic Journ.* No., **5** : 166.

1989. *Brotia (Antimelania) costula* (Rafinesque) Subba Rao. *Handbook, Freshwater Molluscs of India,* p. 108.

1992. *Brotia (Antimelania) costula* (Rafinesque). *Fauna of West Bengal, State Fauna Series,* **3**(9): 21.

Material : 3 exs, Karnataka; 78 exs, Tamilnadu.

Diagnostic Characters : Shell elongate, whorls 12-14, prominent axial ribs.

Other work : Taxonomical studies from Barck valley, Assam, (Gupta, 1998).

Distribution : Bihar, West Bengal, Manipur, Assam and also from Karnataka and Tamilnadu.

Morphometric Measurements : Length: 51.4 mm; Width: 14.3 mm; Height: 14.4 mm.

Subfamily PALUDOMINAE

Genus ***Paludomus*** Swainson, 1840

18. ***Paludomus (Paludomus) annandalei*** Preston, 1909

1909. *Paludomus annandalei* Preston. *Rec. Indian Mus.*, **3** : 278, fig. 1.

1989. *Paludomus (Paludomus) annandalei* Preston. Subba Rao, *Handbook, Freshwater Molluscs of India,* p. 112.

Material : 46 exs, Andhra Pradesh; 21 exs, Tamilnadu; 6 exs, Karnataka; 46 exs, Kerala.

Diagnostic Characters : Shell conoidal, apex eroded, sutures slightly impressed.

Distribution : Western Ghats and also from Andhra Pradesh.

Morphometric Measurements : Length: 11.9 mm; Width: 8.6 mm; Height: 7.9 mm.

19. ***Paludomus (Paludomus) tanschauricus*** (Gmelin, 1771)

1791. *Helix tanscha urica* Gmelin. *Syst. Nat. ed.* **13** : 3655. *Refers to Chemnitz's syst. Conch. Cab.,* **9**: 174, figs. 1246, 1247.

1989. *Paludomus (Paludomus) tanschauricus* (Gmelin). Subba Rao. Hand book, *Freshwater Molluscs of India* p. 118.

Material : 105 exs, Andhra Pradesh; 100 exs, Karnataka, 92 exs, Tamilnadu.

Diagnostic Characters : First few whorls with keeled spiral ridges, aperture ovate, posteriorly pointed.

Distribution : Kerala, Maharashtra, Tamilnadu, Andhrapradesh and also Karnataka.

Morphometric Measurements : Length: 17.7 mm; Width: 10.2 mm; Height: 9.6 mm.

20. ***Paludomus (Stomatodon) stomatodon*** Benson, 1862

1862. *Paludomus (Stomatodon) stomatodon* Benson. *Ann. Mag. Nat. Hist.,* (3)**10** : 415.

1989. *Paludomus (Stomatodon) stomatodon* Benson. Subba Rao. *Hand book, Freshwater Molluscs of India,* p. 122.

Material : 4 exs, Karnataka; 3 exs, Tamilnadu.

Diagnostic Characters : Shell with a large and inflated body whorl, columellar callus broad as in neritids and bears a prominent tooth-like projection on its anterior part. Operculam horny, dark brown with excentric nucleus.

Distribution : Kerala and also Karnataka, Tamilnadu.

Morphometric Measurements : Length: 18.3 mm; Width: 15.3 mm; Height: 13.6 mm.

Subclass PULMONATA

Order BASOMMATOPHORA

family LYMNAEIDAE

Genus ***Lymnaea*** Lamarck, 1799

21. ***Lymnaea (Pseudosuccinea) acuminata*** Lamarck. 1822

1822. *Lymnaea acuminata* Lamarck. *Hist. nat. Anim. Sans Vert.*, **6** (2): 160.

1989. *Lymnaea acuminata* Lamarck. Subba Rao. Handbook, Freshwater Molluscs of India, p. 126.

Material: 12 exs, Andhra Pradesh; 318 exs, Karnataka; 209 exs, Tamilnadu.

Diagnostic Characters : The nature of the spiral whorls of the shell and the outer lip are quite distinct. Two forms are recognised one with the ovate shell and the other with narrow shell.

Other work : Shell variation,environmental plasticity (Agarwal) Annapurna and Bhavanarayana (1993) preference of substratum. Raut and Das (1997) effect of water depths on the hatching of eggs. Bharamalal and Nanaware (2001) effect of temperature on the histological and histochemical changes in the Ovotestis. Bharamal and Nanwara (2001) Photoperiod induced biochemical changes in Ovotesticular cholesterol.

Distribution : Throughout India (In water bodies with abundant vegetation).

Morphometric Measurements : Length : 18.7 mm; Width : 9.1 mm; Height : 13.6 mm

21(a). ***Lymnaea (Pseudosuccinea) acuminata* f. *rufescens*** Gray, 1820

1820. *Limnaea rufescens* Gray, in Sowerby,s *Genera of shells*, **1** : Limnaea, fig. 2.

1989. *Lymnaea (Pseudosuccinea) acuminata* f. *rufescens* Gray. *Fauna of Orissa, State Fauna Series,* **1**(2) : 298-300.

1992. *Lymnaea (Pseudosuccinea) acuminata* f. *rufescens* Gray. *Fauna of West Bengal, State Fauna Series,* **3**(9) : 23.

1997. *Lymnaea (Pseudosuccinea) acuminata* f. *rufescens* Gray. *Fauna of Delhi, State Fauna Series*, **6** : 118.

2000. *Lymnaea (Pseudosuccinea) acuminata* f. *rufescens* Gray. *Zoological Survey of India. Wetland Ecosystem Series,* **2** : *Fauna of Renuka Wetland* p. 19

2002. *Lymnaea (Pseudosuccinea) acuminata* f. *rufescens* Gray. *Zool. Surv. India. Wetland Ecosystem Series,* **3** : *Fauna of Ujani*, P. 139.

2003. *Lymnaea (Pseudosuccinea) acuminata* f. *rufescens* Gray. *Zool. Surv. India. Wetland Ecosystem Series,* **5** : *Fauna of Asan Wetland*, P. 20.

2004. *Lymnaea (Pseudosuccinea) acuminata* f. *rufescens* Gray. *Zool. Surv. India. Conservation Area Series,* **20** : *Fauna of Pench National Park,* P. 149.

Material : 4 exs, Karnataka.

Diagnostic Characters : The shell narrow, mouth relatively shorter and legs expanded.

Distribution : Throughout India.

Morphometric Measurements : Length : 29.3 mm; Width : 14.1.2 mm; Height : 18.9 mm.

21 (b). ***Lymnaea (Pseudosuccinea) acuminata* f. *typica*** Lamarck, 1822

1822. *Lymnaea acuminata* Lamarck, *Hist. Nat. Anim. Sans. Vert.* 6 Pt. **2** : 160.

1989. *Lymnaea (Pseudosuccinea) acuminata* f. *typica* Lamarck *Fauna of Orissa, State Fauna Series,* **1**(2) : 296-298.

1992. *Lymnaea (Pseudosuccinea) acuminata* f. *typica* Lamarck. *Fauna of West Bengal, State Fauna Series,* **3**(9) : 22.

1997. *Lymnaea (Pseudosuccinea) acuminata* f. *typica* Lamarck. *Fauna of Delhi, State fauna Series*, **6** : 117.

2000. *Lymnaea (Pseudosuccinea) acuminata* f. *typica* Lamarck. *Zoological Survey of India, Wetland Ecosystem Series,* **2** : *Fauna of Renuka Wetland,* p. 19.

2003. *Lymnaea (Pseudosuccinea) acuminata* f. *typica* Lamarck. *Zool. Surv. India. Wetland Ecosystem series,* **5** : *Fauna of Asan Wetland.* P. 20.

2004. *Lymnaea (Pseudosuccinea) acuminata* f. *typica* Lamarck. *Zool. Surv. India. Conservation Area Series,* **20** : *Fauna of Pench National Park Asan Wetland.* P. 148.

Material : Not collected.

Distribution : Throughout India.

21 (c). ***Lymnaea (Pseudosuccinea) acuminata* f. *gracilior*** Martens, 1881

1881. *Lymnaea acuminata* var. *gracilior* Martens. *Conch. Mithiel.*, **1** : 77

1989. *Lymnaea (Pseudosuccinea) acuminata* f. *gracilior* Martens. *Fauna of Orissa, State Fauna Series,* **1**(2) : 298.

1992. *Lymnaea (Pseudosuccinea) acuminata* f. *gracilior* Martens. *Fauna of West Bengal, State Fauna Series,* **3**(9) : 23.

1997. *Lymnaea (Pseudosuccinea) acuminata* f. *gracilior* Martens. *Fauna of Delhi State Fauna Series*, **6** : 117- 118.

Material : Not collected.

Distribution : Throughout India.

22. ***Lymnaea (Pseudosuccinea) biacuminata*** Anandale and Rao, 1925

1925. *Lymnaea biacuminata* Anandale and Rao. *Rec. Indian Mus.*, **27** : 182, fig. III-2.

1989. *Lymnaea biacuminata Anandale and Rao.* Subba Rao. Handbook, *Freshwater Molluscs of India,* p. 128.

Material : 5 exs. Karnataka.

Diagnostic Characters : This may be a phenotypic variant of *Lymnaea acuminata* f. *rufescens.*

Distribution : Andhra Pradesh, Uttranchal and also Karnatka.

Morphometric Measurements : Length : 20.9 mm; Width : 10.12 mm; Height : 12.9 mm.

23. ***Lymnaea (Pseudosuccinea) luteola*** Lamarck, 1822

1822. *Lymnaea luteola* Lamarck. *Hist. Nat. Anim. Sans Vert.*, **6**(2) : 160.

1989. *Lymnaea luteola* Lamarck. Subba Rao. Handbook, *Freshwater Molluscs of India,* p. 128.

2002. *Lymnaea luteola* Lamarck. *Zool. Surv. India. Wetland Ecosystem Series,* **3**, *Fauna of Ujani*, P. 139-140.

Material : 61 exs, Karnataka; 35 exs, Tamilnadu.

Diagnostic Characters : Spire not very much pointed shell ovate with narrow aperture.

Distribution : Common found even in temporary waterbodies–Pest of Paddy.

Morphometric Measurements : Length : 16.4 mm; Width : 10.5 mm; Height : 11.4 mm.

23(a) ***Lymnaea (Pseudosuccinea) luteola* f. *typica*** Lamarck, 1822

1822. *Lymnaea luteola* Lamarck, *Hist. Nat. Anim. Sans. Vert.*, 6 pt. **2** : 160.

1989. *Lymnaea (Pseudosuccinea) luteola* f. *typica* Lamarck. *Fauna of Orissa, State Fauna Series,* **1**(2):300-301.

1992. *Lymnaea (Pseudosuccinea) luteola* f. *typica* Lamarck. *Fauna of West Bengal, State Fauna Series,* **3**(9) : 24.

1997. *Lymnaea (Pseudosuccinea) luteola* f. *typica* Lamarck. *Fauna of Delhi, State Fauna Series*, **6** : 118.

2003. *Lymnaea (Pseudosuccinea) luteola* f. *typica* Lamarck. *Zool. Surv. India. Wetland Ecosystem Series,* **5** : *Fauna of Asan Wetland*, P. 21.

2004. *Lymnaea (Pseudosuccinea) luteola* f. *typica* Lamarck. *Zool. Surv. India. Conservation Area Series,* **20** : *Fauna of Pench National Park,* P. 149.

Material : 5 exs Karnataka; 5 exs Tamilnadu.

Distribution : Throughout India.

23 (b) ***Lymnaea (Pseudosuccinea) luteola f.impura*** Troschal, 1837

1837. *Lymnaea impura* Troschal, in *Weigman's Arch. f . Natureges*, **3** : 172.

1989. *Lymnaea (Pseudosuccinea) luteola f.impura* Troschal. *Fauna of Orissa, State Fauna Series,* **1**(2) : 301.

1997. *Lymnaea (Pseudosuccinea) luteola f. impura* Troschal. *Fauna of Delhi, State Fauna Series*, **6** : 119

Material : 288 exs, Karnataka; 5 exs Tamilnadu.

Distribution : Bihar and also Karnataka, Tamilnadu.

Morphometric Measurements : Length : 15.4 mm; Width : 10.8 mm; Height : 11.1 mm.

23(c) ***Lymnaea (Pseudosuccinea) luteola f.ovalis*** Gray, 1822

1820. *Lymnaea ovalis* Gray, in Sowerby,s *Genera of shells*, **1** : Limnaea, fig. 4.

1898. *Lymnaea (Pseudosuccinea) luteola f.ovalis* Gray. *Fauna of Orissa, State Fauna Series,* **1**(2) : 302.

1992. *Lymnaea (Pseudosuccinea) luteola f.ovalis* Gray. *Fauna of West Bengal, State Fauna Series,* **3**(9) : 24-25.

1997. *Lymnaea (Pseudosuccinea) luteola f.ovalis* Gray. *Fauna of Delhi, State Fauna Series*, **6** : 119-120.

2003. *Lymnaea (Pseudosuccinea) luteola f.ovalis* Gray.*Zool. Surv. India. Wetland Ecosystem Series,* **5** : *Fauna of Asan Wetland.* P. 21.

Material : 2 exs, Karnataka.

Distribution : Throughout India.

Morphometric Measurements : Length : 14.7 mm; Width : 10.8 mm; Height : 13.8 mm.

23(d) ***Lymnaea (Pseudosuccinea) luteola* f. *australis*** Anandale and Rao, 1925

1925. *Lymnaea (Pseudosuccinea) luteola* f. *australis* Anandale and Rao, *Rec. Indian Mus.*, **27** : 184.

1989. *Lymnaea (Pseudosuccinea) luteola* f. *australis* Anandale and Rao. *Fauna of Orissa, State Fauna Series,* **1**(2) : 301.

1992. *Lymnaea (Pseudosuccinea) luteola* f. *australis* Anandale and Rao. *Fauna of West Bengal, State Fauna Series,* **3**(9) : 24.

1997. *Lymnaea (Pseudosuccinea) luteola* f. *australis* Anandale and Rao. *Fauna of Delhi, State Fauna Series*, **6** : 114.

2003. *Lymnaea (Pseudosuccinea) luteola* f. *australis* Anandale and Rao. *Zool. Surv. India. Wetland Ecosystem series,* **5** : *Fauna of Asan Wetland*, P. 21.

2004. *Lymnaea (Pseudosuccinea) luteola* f. *australis* Anandale and Rao. *Zool. Surv. India. Conservation Area Series,* **20** : *Fauna of Pench National Park,* P. 149-150.

Material : 2 exs, Karnataka.

Distribution : Throughout India.

Morphometric Measurements : Length : 22.6 mm; Width : 14.9 mm; Height : 14.6 mm.

24. ***Lymnaea (Pseudosuccinea) ovalior*** Anandale and Prashad

1921. *Limnaea ovalior* Annandale and Prashad. *Rec. Indian. Mus.*, **22** : 572.

1989. *Lymnaea (Pseudosuccinea) ovalior* Anandale and Prashad. Subba Rao. Handbook, *Freshwater Molluscs of India,* p. 129.

Material : 3 exs Karnataka.

Diagnostic Characters : Having more similar characters of *Lymnaea luteola* f. *ovalis*, requires detailed study.

Distribution : Manipur and also Karnataka.

Family ANCYLIDAE

Genus ***Ferrissia*** Walker, 1903.

25. ***Ferrissia tenuis*** (Bourguignat, 1862)

1862. *Ferrissia tenuis* Bourguignat. *Spicil. Malac.*, **1862** : 208.

1989. *Ferrissia tenuis* (Bourguignat). Subba Rao. Handbook, *Freshwater Molluscs of India,* p. 138.

Material : Not collected.

Diagnostic Characters : Found in died decaying leafs submerged in water.

Distribution : Andhra Pradesh; Karnataka; Kerala; Tamilnadu; Maharashtra.

26. ***Ferrissia verruca*** (Benson, 1855)

1855. *Ferrissia verruca* Benson. *Ann. Mag. Nat. Hist.*, **15** (2) : 12.

1989. *Ferrissia verruca* (Benson). Subba Rao. Hand book, *Freshwater Molluscs of India,* p. 139.

Material : Not collected.

Distribution : Throughout India.

Family PLANORBIDAE

Subfamily BULININAE

Genus ***Indoplanorbis*** Annandale and Prashad

27. ***Indoplanorbis exustus*** (Deshayes)

1834. *Planorbis exustus* Deshayes, in Belangar, *Voy. Indes-Orientales*, p. 417, pl. 1, figs. 11-13.

1989. *Indoplanorbis exustus* (Deshayes). Subba Rao. *Handbook, Freshwater Molluscs of India,* p. 142.

1992. *Indoplanorbis exustus* (Deshayes). *Fauna of West Bengal, State Fauna Series,* **3**(9) : 25.

1997. *Indoplanorbis exustus* (Deshayes). *Fauna of Delhi, State Fauna Series*, **6** : 120.

2002. *Indoplanorbis exustus* (Deshayes). *Zool. Surv. India. Wetland Ecosystem series*, **3**, *Fauna of Ujani*, P. 137-138.

2003. *Indoplanorbis exustus* (Deshayes). *Zool. Surv. India. Wetland Ecosystem series*, **5**, *Fauna of Asan Wetland*, P. 21.

2004. *Indoplanorbis exustus* (Deshayes). *Zool. Surv. India. Conservation Area Series,* **20**, *Fauna of Pench National Park,* P. 150.

Material : 93 exs, Andhra Pradesh; 449 exs, Karnataka; 10 exs, Kerala; 21 exs, Pondicherry; 621 exs, Tamilnadu.

Diagnostic Characters : Shell large and thick, sutures deeply impressed, animal sinistral, aperture ear-shaped and foot leaf shaped.

Other works : Annapurna and Bhavanarayana (1993) preference of substratum. Bharamal and Nanaware (2001) effect of temperature on ovotesticular lysosomal enzymes. Raut and Das (1997) effect of water depth on the hatching of eggs of snail. Singh ans Saxena (2002) substrate preferences among gastropod specimens in a pond in the arid region of Rajasthan.

Distribution :Throughout India.

Morphometric Measurements : Diameter : 17.7 mm; Height : 7.7 mm.

Subfamily SEGMENTINAE

Genus ***Segmentina*** Flemming, 1817

28. ***Segmentina (Polypylis) trochoidea*** (Benson, 1836)

1836. *Planorbis trochoideus* Benson. *J. Asiat. Soc. Beng.*, **5** : 742.

1989. *Segmentina (Polypylis) trochoidea* (Benson). Subba Rao. Hand book, *Freshwater Molluscs of India,* p. 150.

Material : Not collected.

Diagnostic Characters : Shell trochoid,

periphery more acute, umbilicus small or totall absent.

Distribution : Karnataka; Tamilnadu; West Bengal.

Subfamily PLANORBINAE

Genus ***Gyraulus*** Charpentier

29. ***Gyraulus convexiusculus*** (Hutton)

1849. *Planorbis convexiusculus* Hutton. *J. Asiat. Soc. Beng.*, **18** (2) : 657.

1989. *Gyraulus convexiusculus* (Hutton). Subba Rao. Handbook, *Freshwater Molluscs of India,* p.154.

1989. *Gyraulus convexiusculus* (Hutton). *Fauna of Orissa, State Fauna Series*, **1**(2) : 304.

1992. *Gyraulus convexiusculus* (Hutton). *Fauna of West Bengal, State Fauna* Series, **3**(9) : 26.

1997. *Gyraulus convexiusculus* (Hutton). *Fauna of Delhi, State Fauna Series*, **6** : 120-121.

2003. *Gyraulus convexiusculus* (Hutton). *Zool. Surv. India. Wetland Ecosystem Series,* **5** : *Fauna of Asan Wetland*, P. 21.

2004. *Gyraulus convexiusculus* (Hutton). *Zool. Surv. India. Conservation Area Series*, **20** : *Fauna of Pench National Park,* P. 151.

2004. *Zool. Surv. India. Conservation Area Series,* **20** : *Fauna of Pench National Park,* P. 146.

Material : 1 ex, Karnataka; 5 exs Tamilnadu.

Diagnostic Characters : Whorls 4 or 5 rounded, aperture ovate, maximum diameter within 5mm.

Distribution : Throughout India.

Morphometric Measurements : Diameter : 3.0 mm.

DISCUSSION

Based on the earlier studies 14 species of gastropods with 4 forms belonging to 11 genera are reported from Karnataka and the species are as follows : *Neritina (Dostia) violacea; Bellamya dissimilis; Pila virens.; Mysorella costigera; Thiara (Thiara) scabra; Thiara (Melanoides) tuberculata; Sulcospira hugely; Paludomus (Paludomus) obesus; Lymnaea luteola f. ovalis; Ferrissia tenuis; Ferrissia verruca; Indoplanorbis exustus* and *Segmentina (Polypylis) trachoidea* (Subba Rao, 1989; Ramakrishna et al 2006).

During the present study the following species are recorded for the first time : *Pila globosa; Gabbia alticola; Stenothyra blanfordiana; Thiara (Tarebia) lineata; Brotia (Antimelania) costula; Lymnaea (Pseudosuccinea) acuminata; Lymnaea (Pseudosuccinea) biacuminata; Lymnaea (Pseudosuccinea) ovalior* and *Lymnaea luteola f. australis.* In view of the above a total of 29 species with 7 forms and one variety are available in Karnataka state.

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Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 33-38, 2013

ANNELIDA : EARTHWORM

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INTRODUCTION

The beneficial effect of earthworms in increasing soil fertility has been documented since the time of Darwin (1881). Presently, earthworms are not restricted as a basic biology material but is being established as basic material for biotechnology (vermitechnology). Because of economic value, understanding of the distribution, abundance and ecological condition of the earthworms has become very important. Though earthworms of various locality of our country were well studied by Stephenson (1923); Julka (1988); Haider (1998) and Paliwal & Julka (2005) but our knowledge is very poor regarding the earthworm fauna of Karnataka. Haider, K.R. *et al* (2007) reported some 29 species from the unnamed collection of Zoological survey of India from the state of Karnataka. A recent survey was undertaken in different ecological regions of Karnataka during the year 2006-2008 and a total 21 species under 14 genera and 5 families are collected of which 7 species have been recorded for the first time from this state.

SYSTEMATIC ACCOUNT

Phylum ANNELIDA

Class OLIGOCHAETA

A. Order MONILIGASTRIDA

I. Family MONILIGASTRIDAE

1. Genus ***Drawida*** Michaelsen, 1900

*1. *Drawida nepalensis* Michaelsen, 1907

*2. *Drawida wilsi* Michaelsen, 1907

B. Order HAPLOTAXIDA

II. Family LUMBRICIDAE

2. Genus ***Eisenia*** Malm, 1877

*3. *Eisenia fetida* (Savingny, 1826)

3. Genus ***Octolasion*** Orley, 1858

4. *Octolasion tyrtaeum* (Savigny, 1826)

III. Family MEGASCOLECIDAE

4. Genus ***Amynthas*** Kinberg, 1867

5. *Amynthus cortices* (Kingberg, 1867)

5. Genus ***Lampito*** Kinberg, 1866

*6. *Lampito mauritii* Kinberg, 1866

6. Genus ***Metaphire*** Sims & Easton, 1972

*7. *Metaphire posthuma* (Vaillant, 1868)

8. *Metaphire houlleti* (Perrier, 1872)

7. Genus ***Perionyx*** Perrier, 1872

9. *Perionyx excavatus* Perrier, 1872

10. *Perionyx sansibaricus* Michaelsen, 1909

IV. Family OCTOCHAETIDAE

8. Genus ***Berogaster*** Gates, 1939

11. *Berogaster* sp.

9. Genus ***Dichogaster*** Beddard, 1888

12. *Dichogaster bolaui* (Michaelsen, 1891)

10. Genus ***Octochaetona*** Gates, 1962

13. *Octochaetona beatrix* (Beddard, 1902)

*14. *Octochaetona surensis* (Michaelsen, 1910)

15. *Octochaetona parva* (Gates, 1945)

11. Genus ***Hoptochaetella***

16. *Hoptochaetella anomala* Stephenson, 1920

12. Genus ***Ramiella***

17. *Ramiella heterochaeta* Michaelsen, 1922

13. Genus ***Pellogaster*** Gates, 1939

18. *Pellogaster bermudensis* Gates, 1939

19. *Pellogaster matheranensis* Gates, 1939

V. Family ALMIDAE

14. Genus ***Glyphidrilus*** Horst, 1889

20. *Glyphidrilus annandalei* Michaelsen, 1922

*21. *Glyphidrilus tuberosus* Stephenson, 1916

Species marked with asterix (*) are recorded for the first time from the state of India.

Phylum ANNELIDA

Class OLIGOCHAETA

A. Order MONILIGASTRIDA

I. Family MONILIGASTRIDAE

Genus 1. ***Drawida*** Michaelsen, 1900

1900. ***Drawida*** Michaelsen, *Tier. X,* 114.

1. ***Drawida nepalensis*** Michaelsen, 1907

1907. *Drawida nepalensis* Michaelsen, *Mt. Mus. Hamburg,* xxiv, 146.

Material examined : 2 ex., 3618/1, K.R. Puram, Kaskot, Bangalore, 20.iii.2007, Coll. C.K.Mandal

Diagnosis : Length 60-135mm; diameter 2.1-5.2 mm. segments 120-180. Male pore at 10/11 segment. Female pore at 11/12 segment.

Distribution : India : West Bengal; Andaman and Nicobar Islands; Assam; Bihar; Himachal Pradesh; Meghalaya; Sikkim; Uttar Pradesh; Uttarakhand, Karnataka.

Elsewhere : Pakistan; Nepal, Bangladesh; Myanmar; Indonesia.

Remarks : This species is first recorded from this state.

2. ***Drawida wilsi*** Michaelsen, 1907

1907. *Drawida wilsi* Michaelsen, *Mt. Mus. Hamburg,* xxiv, 145.

Material examined : 1 ex., 3619/1, K.R. Puram, Kaskot, Bangalore, 20.iii.2007, Coll. C.K. Mandal.

Diagnosis : 55-60mm in length, maximum diameter 2.5 mm. Segments 155-160. Clitellum ring shaped. Two gizzards, in XIV and XV. Male pores on transversely oval papillae in b. Female pores in ab.

Distribution : India ; Madhya Pradesh; Andhra Pradesh; Uttar Pradesh; Uttarakhand and Karnataka.

Remarks : This species is first recorded from this state.

B. Order HAPLOTAXIDA

II. Family LUMBRICIDAE

Genus 2. ***Eisenia*** Malm, 1877

1877. *Eisenia* Malm, *Ofvers. Sallsk. Hortikult. Vann. Forh.* Goteburg. **1** : 45.

3. ***Eisenia foetida*** (Savingny, 1826)

1826. *Enterion foetidum* Savingny, *Mem. Acad. Sci. Inst. Fr.,* **5** : 182.

1981. *Eisenia foetida* Julka, *Rec. zool. Surv. India,* **80** : 132.

Material examined : 5 ex., 3620/1, K.R. Puram, Kaskot, Bangalore, 20.iii.2007, Coll. C.K. Mandal.

Diagnosis : 28-129 mm length, segments 80-131. Prostomium epilobic, tongue open. Clitellum saddle shaped, beginning from XXVII-XXVII and ending in XXXI-XXXIV. Female pores at XIV. Male pores at or near m BC on XV.

Distribution : India : West Bengal; Himachal Pradesh; Kerala; Nicobar islands; Sikkim; Tamil Nadu, Karnataka.

Elsewhere : Europe; Lebanon; Turkey; Afganistan; Korea; Japan; Australia; New Zealand; North America; West Indies; South America; Some islands in the Atlantic Ocean.

Remarks : This species is first recorded from this state.

Genus 3 ***Octolasion*** Orley, 1858

1885. *Octolasion* Orley, *Ert. Term. Kor.*, **15** : 13.

4. ***Octolasion tyrtaeum*** (Savigny 1826)

1826. *Enterion tyrtaeum* Savingny, *Mem. Acad. Sci. Inst. Fr.,* **5** : 180.

1972. *Octolasion cyaneum* Gates, *Trans. Am. Phil. Soc.*, **62**(7) : 125.

1980. *Octolasion tyrtaeum* Soota & Haider, *Rec. zool. Surv. India,* **76** : 203.

Material examined : 5 ex., 3621/1, Kuknali kere, Mysore, 23.iii.2007, Coll. C.K. Mandal.

Diagnosis : Clitellum, saddle shaped, six segments, XXX-XXXV. Un interrupted longitudinal bands.

Distribution : India : Uttarakhand; West Bengal; Himachal Pradesh; Kashmir; Sikkim; Tamil Nadu; Uttar Pradesh, Karnataka.

Elsewhere : Africa; Europe; Pakistan; Australia; Canada; U.S.A; Mexico; some Islands in the Atlantic ocean; South America.

III. Family MEGASCOLECIDAE

Genus 4. ***Amynthas*** Kinberg, 1867

1867. ***Amynthas*** Kinberg, *Ofvers. K. Vetens. Acad. Forhandl.* Stockholm, **23** : 97.

5. ***Amynthus cortices*** (Kingberg, 1867)

1867. *Perichaeta corticis* Kingberg, *Ofvers. K. Vetensk Acad. Forth. Stockh.,* **23** : 102

Material examined : 3 ex., 3381/1, Kuknali kere, Mysore, 23.iii.2007, Coll. C.K. Mandal.

Diagnosis : Length 45-170 mm. Diameter 3-6 mm. Segmets 79-121. Prostomium epibolic, tongue open. Clitellum on XIV-XVI segment. Genital markings small.

Distribution : India: Uttarakhand; West Bengal; Himachal Pradesh;Jammu and Kashmir; Sikkim; Tamil Nadu; Uttar Pradesh; Arunachal Pradesh; Assam; Manipur; Meghalaya; Karnataka.

Elsewhere : Africa; Madagascar; Europe; China; Korea; Japan; Sri Lanka; Nepal; Bhutan; Bangla Desh; Myanmar; Indonesia; Philippines; Hainan; Hong Kong; Taiwan; Australia; New Zealand; Some islands in the Pacific Ocean; U.S.A; Central America; West Indies; South America.

Remarks : This species is first recorded from this state.

Genus 5. ***Lampito*** Kingberg, 1867

1866. *Lampito* Kingberg, *Ofvers. K. Vetensk Acad. Forth. Stockh.,* **23** : 103.

6. ***Lampito mauritii*** Kinberg, 1866

1866. *Lampito* Kingberg, Ofvers. K. *Vetensk Acad. Forth. Stockh.,* **23** : 103.

Material examined : 3 ex., 3376/1, Kuknali kere, Mysore, 23.iii.2007. Coll. C.K. Mandal.

Diagnosis : Clitellum annular, dorsal pores present. Digestive system with a single oesophageal gizzard in V. Male pores paired on XVIII. Female pores paired on XIV.

Distribution : India: All over India and world.

Remarks : First recorded from this state.

Genus 6. ***Metaphire*** Sims and Easton, 1972

1972. *Metaphire* Sims and Easton, *Biol. J. Linn. Soc.,* **4**(3) : 215.

7. ***Metaphire houlleti*** (Perrier, 1872)

1872. *Perichaeta houlleti* Perrier, *Nouv. Arch. Mus. Hist. nat. Paris,* **8** : 99.

1982. *Metaphire. houlleti* Julka, *Rec. zool. Surv. India,* **80** : 142.

Material examined : 3 ex., 3380/1, Lalbagh Bangalore, 21.iii.2007, Coll. C.K. Mandal.

Diagnosis : length 40-200 mm. Diameter 3-8 mm. Segmets 90-140. Prostomium epibolic, tongue open. Male pores minute on XVIII. Female pore single.

Distribution : India : West Bengal; J&K; H.P.; Uttarakhand; Uttar Pradesh. Outside India: Sierra Leone, Pakistan, China, Sri Lanka; Myanmar, Thailand, Malay Peninsula, Indonesia, Florida (U.S.A), Salvador, Cuba, Bahamas.

8. ***Metephireposthuma*** Vaillant, 1868

1868. Perichaeta posthuma Vaillant, *Annl Sci. Nat.,* (ser). 5, **10** : 228.

1972. *Metephire posthuma* Sims & Easton, *Biol. J. Linn. Soc.,* **4**(3) : 239.

Material examined : 3 ex., 3623/1, Kuknali kere, Mysore, 23.iii.2007, Coll. C.K. Mandal.

Diagnosis : Length 60-140 mm, diameter 3-8 mm. Segments 91-124. Prostomium epilobic. Genital markings paired. Female pore single, mid-

ventral on XIV segment. Male pores, minute and invaginate, on XVIII.

Distribution : India Almost all over India.

Elsewhere : Pakistan; Bangla Desh; Myanmar; Thailand; Vietnam; Malay Peninsula; Indonesia; Philippines; U.S.A.

Genus 7. ***Perionyx*** Perrier, 1872

1872. *Perionyx* Perrier, Nouv. *Arch. Mus. Nat. Hist.* Paris, **8** : 126.

9. ***Perionyx excavatus*** Perrier, 1872

1872. *Perionyx excavatus* Perrier, *Nouv. Arch. Mus. Hist. nat.* Paris, **8** : 126.

1897. *Perionyx excavatus* Julka & Senapati, *Rec. zool. Surv. India, Occ. Paper* No. **92** : *13.*

Material examined : 7 ex., 3374/1, K.R. Puram, Kaskot, Bangalore, 20.iii.2007, Coll. C.K. Mandal

Diagnosis : Length 175 mm, diameter 2.5-4.5 mm. Segments 178. Colour yellowish brown. Prostomium epilobous. Clitellum on XIII-XVII. Male pores very close together on XVI11 segment.

Distribution : India : All over India.

Elsewhere : Philippines; Malay Archipelago; Siam; China.

10. ***Perionyx sansibaricus*** 1909

1909. Perionyx sansibaricus Michaelsen, *Mem. Ind. Mus.*, 174.

Material examined : 2 ex., 3375/1, K.R. Puram, Kaskot, Bangalore, 20.iii.2007, Coll. C.K. Mandal.

Diagnosis : Length 175 mm, diameter 2.5-4.5 mm. Segments 178. Colour yellowish brown. Prostomium epilobous. Clitellum on XIII-XVII. Male pores very close together on XVIII segment.

Distribution : India : All over India.

Elsewhere : Philippines; Malay Archipelago; Siam; China.

IV. Family OCTOCHAETIDAE

Genus 8. ***Berogaster*** Gates, 1939

1939. Gates, *Rec. Indian Mus.*, **41**: 154.

11. ***Berogaster*** sp.

Diagnosis : Length 95-110 mm. Segments 130. Prostomium prolobic. Clitellum on XIII- XVII. Spermathecal pores minute.

Material examined : lex., 3378/1, Lalbagh, Bangalore, Karnataka, 23.iii.2007, Coll. C.K. Mandal.

Distribution : India : Karnataka.

Genus 9. ***Dichogaster*** Beddard, 1888

1888. *Dichogaster* Beddard, *Q. Jt. microsc. Sci.,* **29** : 251.

12. ***Dichogaster bolaui*** (Michaelsen, 1900)

1900. *Dichogaster bolaui,* Michaelsen, *Tierreich,* **10** : 340.

1978. *Dichogaster bolaui bolaui,* Righi *et al., Acta Amazonica,* **8**(3), suppl. **1** : 38.

Material examined : 2 ex., 3623/1, Lalbagh, Bangalore, Karnataka, 23.iii.2007, Coll. C.K. Mandal.

Diagnosis : Length 19-23 mm, diameter l-3mm. Segments 70-98. Prostomium epilobous. Tongue closed. Clitellum on XI1I-XXI. Male pores minute on XVIII segment. Female pores single, median, presetal. Genital markings absent.

Distribution : All over India and world.

Genus 10. ***Octochaetona*** Gates, 1962

1962. ***Octochaetona*** Gates, *Ann. Mag. Nat. Hist.* (ser. 13), **5** : 211.

13. ***Octochaetona beatrix*** (Beddard, 1902)

1902. *Octochaetus beatrix* Beddard, *Ann. Mag. Nat. Hist.* (ser. 7), 9: 456.

1962. *Octochaetona beatrix* Gates, *Ann. Mag. Nat. Hist.* (ser. 13), 5: 213.

Material examined : 3 ex., 3377a/1, Kuknali kere, Mysore, 23.iii.2007, Coll. C.K. Mandal.

Diagnosis : Length 40-134 mm, diameter 2-5 mm. Segments 133-197. Prostomium proepilobous. Tongue closed. Clitellum on XIII-XVIII. Male pores minute.

Female pores paired. Genital markings absent.

Distribution : India : Uttarakhand; Uttar Pradesh; Madhya Pradesh; Arunachal Pradesh; Maharashtra; Gujarat; West Bengal; Karnataka.

Elsewhere : Pakistan; Myanmar; Malay peninsula; Philippines

14. ***Octochaetona surensis*** (Michaelsen, 1910)

1910. *Octochaetus surensis,* Michaelsen, *Abh. Geb. Naturw.,* Hamburg, **19(5)** : 88.

1962. *Octochaetona surensis* Gates, *Ann. Mag. Nat. Hist.* (ser. 13), 5 : 213.

Material examined : 3 ex., 3377b/l, Kuknali kere, Mysore, 23.03.2007, Coll. C.K.Mandal.

Diagnosis : Length 60-140 mm, diameter 2.5-6 mm. Segments 111-180. Prostomium epilobous. Tongue closed. Clitellum on XIII-XVII. Male pores minute. Female pores paired. Genital markings oval, paired on some of XVIII-XXXII.

Distribution : India : Uttarakhand; Uttar Pradesh; Madhya Pradesh; Karnataka.

Elsewhere : Myanmar.

Remarks : First recorded from this state.

15. ***Octochaetona parva*** (Gates, 1945)

1945. *Octochaetoidesparvus* Gates, *Jl. R. Asiat. Soc. Beng.*, **11**: 84.

1962. *Octochaetona parva* Gates, *Ann. Mag, nat. Hist,* (ser. 13), 5: 213.

Diagnosis : Length 70-100 mm, diameter 3-4mm. Segments 80. Prostomium epilobous. Tongue open. Clitellum on XIII-XVII. Male pores minute.

Distribution : India : Andhra Pradesh; Karnataka.

Genus 11. ***Hoptochaetella*** Michaelsen, 1900

1900. *Hoptochaetella* Michaelsen, *Tierreich,* **10** : 321.

16. ***Hoptochaetella anomala*** Stephenson, 1920

1920. *Hoptochaetella anomala* Stephenson, *Mem. Indian Mus.,* 7 : 223.

1940. *Hoptochaetella anomala,* Gates, *Rec. Indian Mus.*, **42** : 212.

Diagnosis : Length 48-139 mm, diameter 2.5-4mm. Segments 66-117. Prostomium epilobous. Tongue open. Clitellum on XIII-XVII. Male pores minute. Genital markings oval.

Distribution : India : Maharashtra; Karnataka.

Genus 12 ***Pellogaster*** Gates, 1939

1939. *Pellogaster* Gates, *Rec. Indian Mus.,* **41** : 200.

17. ***Pellogaster bermudensis*** Gates, 1939

1939. *Pellogaster bermudensis* Gates, *Rec. Indian Mus.*, **41** : 200.

Material : Not collected during this survey.

Diagnosis : Length 60-140 mm, diameter 2.5-6 mm. Segments 111-180. Prostomium epilobous. Tongue closed. Clitellum on XIII-XVII. Male pores minute. Female pores paired. Genital markings oval,paired on some of XVIII-XXXII.

Distribution : India : Uttarakhand; Uttar Pradesh; Madhya Pradesh; Karnataka.

Elsewhere : Myanmar.

18. ***Pellogaster matheransis*** Gates, 1939

1939. *Pellogaster matheransis* Gates, Rec. Indian Mus., **41** : 200.

Diagnosis : Length 60-140 mm, diameter 2.5-6 mm. Segments 111-180. Prostomium epilobous. Tongue closed. Clitellum on XIII-XVII. Male pores minute. Female pores paired. Genital markings oval, paired on some of XVIII-XXXII.

Distribution : India : Uttarakhand; Uttar Pradesh; Madhya Pradesh; Karnataka.

Elsewhere : Myanmar.

Genus 13. ***Ramiella*** Stephhenson, 1921

1921. *Ramiella* Stephhenson, P.Z.S. 109.

19. ***Ramiella bishambari*** (Stephenson, 1900)

1914. *Octochaetus bishambari,* Stephenson, *Rec. Ind. Mus.,* **X**, 347.

1921. *Ramiella bishambari,* Stephhenson, P.Z.S. 109.

Diagnosis : Length 35 mm, diameter 1 mm. Segments 85. Prostomium epilobous. Gizzard in vi. Clitellum on xiv-xvi.

Distribution : India : Uttarakhand; Uttar Pradesh.

V. Family ALMIDAE

Genus 14. ***Glyphidrilus*** Horst, 1889

1889. *Glyphidrilus* Horst. Tijdschr. Nederlandsche Dierk. Ver. 2, **2**: LXXVI.

20. ***Glyphidrilus annandalei*** *Michaelson*

Diagnosis : Length 60-140 mm, diameter 2.5-6 mm. Segments 111-180. Prostomium epilobous. Tongue closed. Clitellum on XIII-XVII. Male pores minute.

Female pores paired. Genital markings oval,paired on some of XVIII-XXXII.

Distribution : India : Uttarakhand; Uttar Pradesh; Madhya Pradesh, Karnataka.

Elsewhere : Myanmar.

21. ***Glyphidrilus tuberosus*** Stephenson, 1916

1916. *Glyphidrilus tuberosus* Stephenson, *Rec. Indian Mus.*, **12**: 349

1987. *Glyphidrilus tuberosus* : Julka & Senapati, *Rec. zool. Surv. India, Occ. Paper* No. **92** : 6.

Material examined : 3 ex., 3624/1, Kuknali kere, Mysore, 23.iii.2007, Coll. C.K. Mandal.

Diagnosis : Length 60-140 mm, diameter 2.5-6 mm. Segments 111-180. Prostomium epilobous. Tongue closed. Clitellum on XIII-XVII. Male pores minute.

Female pores paired. Genital markings oval, paired on some of XVIII-XXXII.

Distribution : India : Uttarakhand; Uttar Pradesh; Madhya Pradesh, Karnataka.

Elsewhere : Myanmar.

SUMMARY

The paper deals with earthworms of Karnataka, specimens collected from difficult districts of Karnataka, a total of 21 species belonging to 14 genera and 5 families recorded from Karnataka. As those species were described earlier only a brief diagnosis and distribution of those species are included.

ACKNOWLEDGEMENTS

We are grateful to the Director, Zoological Survey of India, Dr. N.C. Nandi, Scientist 'F', and O/C F.P.S. Building and Dr. A. Misra, Retired Scientist C., General Non-Chordata Section, ZSI for lucid suggestions during the study of the earthworms, and our special thanks to Dr. J.G. Pattanayak, O/C General Non-Chordata Section for critical going through our manuscript. And deep gratitude to the officers and staffs, General Non-Chordata section for their valid suggestions.

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Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 39-49, 2013

ANNELIDA : FRESHWATER OLIGOCHAETA

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INTRODUCTION

Aquatic oligochaetes are very common micro-invertebrates occur in a diversity of water bodies. They are usually very thin and small ranging from about 1 mm to a few centimeters in length. They are loosely termed "microdriles" and comprise of 13 families. Most microdriles are fully aquatic, with the exception of Enchythaeidae, a family i.e. primarily terrestrial. About 1700 valid species of aquatic oligochaetes are known to date, of these about 1100 are freshwater. The most speciose group is the Tubificidae which at present includes over 1000 described species, 582 of which are considered freshwater inhabitants.

Our knowledge of Indian Freshwater Oligochaeta is based on the contributions made by several workers and is well scattered in the literature. A resume of work on Indian freshwater oligochaeta was dealt with in the book "Fauna of British India" by Stephenson (1923). The most important and comprehensive works on Indian freshwater Oligochaeta are fauna of Indian aquatic Oligochaeta by Naidu (1956-2005), Mehra (1922-1927), Aiyar (1924-1929), Carnovitov (1942), Ali (1971), Radhakrishna and Sashibala (1977) and Mukhopadhaya (1998-2005) are worth to mention. The present attempt was made to know the current status of freshwater Oligochaeta in the different districts of Karnataka (Billary, Mysore, Bangalore, Raichur, Simoga) survey was undertaken during the year 2006-2008.

A list of freshwater Oligochaeta so far known from Karnataka is also furnished. The present paper includes description, distribution along with the key for identification of eight species so far recorded from present study area of five districts of Karnataka.

MATERIAL AND METHOD

Collection : Aquatic worms living in mud and silt are collected along with under water soil and then washing them on a white based enamel tray. Those found on surface of water collected readily with the help of a wide mouthed pipette or bent needle. Specimen living among aquatic vegetation and algal masses are collected along with the substrata and washing them afterwards.

Preservation : The best and most successful method of preservation is to pour worms directly into 4% formalin. Nacrotisation before preservation does not help in these delicate worms because they disintegrate by the effect of the narcotizing agent. The bigger Tubifid worms may however be narcotized with gradually increasing dose of alcohol. Preservation directly with formalin has one disadvantage which is opacity the specimen undergo, which is to be overcome during studies by agent like lactophenol etc.

Study : The detail study of the anatomy and morphology can be best accomplished by examining the worm in living condition. The specimens are put on a slide with an excess amount of water and covered by a cover slip. As the water dries up the full anatomical details can be studied.

In the laboratory the preserved material is studied under microscope after treatment with

glycerin which bring out some amount of transparency and make the specimens most suitable for observation and study.

MORPHOLOGY AND TERMINOLOGY

Prostomium : Anterior part of the body above the mouth opening. It may be conical, semicircular, rounded, triangular or sharply or bluntly pointed. It may be also extended as a whip like process, the proboseis (*Stylaria, Pristina*).

Setae : Minute, microscopic locomotory structure arranged in dorsal and ventral bundles, one pair mid-dorsally and mid ventrally segment. These are of various shapes and play the highest role in taxonomy.

Hair : Elongated, slender look like an individual hair.

Needles : Short, broad with simple or bifid tips or pectinate with multiple tips; usually with a median swelling, the nodules. The body may be bent in the form of a sickle.

Crotches : These resemble single or double pointed hooks with equal or unequal ends or teeth. The teeth may again be pointed blunt or pectinate.

Ventral setae : These are characteristically double headed (pronged), hook like (crotchet) with the swollen portion (noodles) at different position of the shaft. In shape they resemble the English letter f, and usually begin from the II segment.

Gills or branchiate : Specialised organelles for gaseous exchanges. These may be simple extensions of the body arranged serially on the mid-dorsal line each having a loop of blood vessel (Branchiodrilus, Branchiura) or leaf like expansions at the hind end of the body in a hollow area, the branchial fossas (*Dero*).

LIST OF FRESHWATER OLIGOCHAETA

Phylum ANNELIDA

Class CLITELLATA

Oligochaetous clitillata [= Oligochaeta]

Superorder MICRODRILI

Order TUBIFICIDA

Family TUBIFICIDAE

1. Subfamily **NAIDINAE**

1. Genus ***Chaetogaster*** Vonbaer, 1827

1. *Chaetogaster cristallinus* Vejdovsky, 1883
2. *Chaetogaster diastrophus* (Gruithuisen, 1828)
3. *Chaetogaster langi* Bretscher, 1896

2. Genus ***Nais*** Muller, 1773

4. *Nais andhrensis* Naidu and Naidu, 1981
5. *Nais communis* Piguet, 1906
6. *Nais variabilis* Piguet, 1906

3. Genus ***Haemonais*** Bretscher, 1900

7. *Haemonais waldvogeli*, Bretscher, 1900

4. Genus ***Branchiodrilus*** Michaelsen, 1900

8. *Branchiodrilus semperi* (Bourne, 1890)

5. Genus ***Dero*** Oken, 1815

9. *Dero cooperi* Stephenson, 1932
10. *Dero digitata* (Muller, 1773)
11. *Dero indica* Naidu, 1962
12. *Dero plumose* Naidu, 1962
13. *Dero sawayai* Marcus, 1943
14. *Dero zeylanica* Stephenson, 1913

6. Genus ***Aulophorus*** Schmarda, 1861

15. *Dero (Aulophorus) furcatus* (Muller, 1773)
16. *Dero (Aulophorus) hymanae* Naidu, 1963
17. *Dero (Aulophorus) michaelseni* Stephenson, 1923
18. *Dero (Aulophorus) tonkinensis* (Vejdovsky, 1894)

7. Genus ***Allonais*** Sperber, 1945

19. *Allonais gwaliorensis* (Stephenson, 1920)
20. *Allonais rayaslaseemensis* Naidu, 1963

8. Genus ***Stephensonianae*** Cernosvitov, 1938

21. *Stephensoniana trivandrana* (Aiyar, 1926)

2. Subfamily PRISTININAE

9. Genus ***Pristina*** Ehrenberg, 1828

22. *Pristina aequiseta* Bourne, 1891
23. *Pristina foreli* Piguet, (1906)
24. *Pristina longiseta longiseta* Ehrenberg, 1828

25. *Pristina synclites* Stephenson, 1925

3. Subfamily TUBIFICINAE

10. Genus ***Tubifex*** Lamarch, 1816

26. *Tubifex tubifex* (Müller, 1774)

11. Genus ***Limnodrilus*** Claparede, 1862

27. *Limnodrilus hoffmeisteri* Claparede, 1862

12. Genus ***Aulodrilus*** Bretscher, 1899

28. *Aulodrilus pigueti* Kowalewski, 1914

29. *Aulodrilus pluriseta* (Piguet, 1906)

4. Subfamily RHACODRILINAE

13. Genus ***Bothrioneurum*** Stole, 1888

30. *Bothrioneurum iris* Beddard, 1901

14. Genus ***Branchiura*** Beddard, 1892

31. *Branchiura sowerbyi* Beddard, 1892

SYSTEMATIC ACCOUNT

Family TUBICIFIDAE

Diagnosis : dorsal setae from II, hair setae present or absent; otherwise bifid setae or with any number of intermediate teeth forming obscurely to completely pectinate setae or rarely palmate setae, even simple-pointed setae but these mostly in posterior bundles. Ventral setae in indefinite number per bundle, beginning in second, bifid or rarely simple-pointed. Clitellum in a few segment in region of gonads. Spermathecal or penial setae or both modified or absent in matured specimen. Asexual reproduction

By fragmentation. Cosmopolitan

Type genus ***Tubifex*** Lamarck, 1816

This family is divided into six subfamilies : Tubificinae, Naidinae, (formarly Naididae but now treated as a subfamily : Erséus and Gustavsson, 2002) Telmatodrilinae, Rhyacodrilinae, Phallodrilinae and Limnodrilodinae.

Key to the subfamilies

1. Coelomocytes abundant .... RHYACODRILINAE

– Coelomocytes present or absent 2

2. Atria with solid prostate attached by narrow stalk, spermatophores in spermathica .... TUBIFICINAE

3. Often diffuse prostate gland on vasa differentia or atria, spermathica usually opening apart sometimes accompanied by special setae..... ..... NAIDINAE

Subfamily NAIDINAE

Diagnosis : Eyes normally present. Pharyngeal, Oesophagal and sepal gland present. No especially elongated segment. Pharynx with dorsal diverticulum. Male reproductive organ in IV segment 4 or more pair of commissural vessels.

Key to the genera known from the area of study

1. Branchial processes present 2

– Branchial processes absent 5

2. Gills finger like dorso-lateal processes, two per segment in anterior segments .... *Branchiodrilus*

3. Gill processes around anus in funnel-shaped fossa at hind end 4

4. Branchial fossa with Palps ..... *Aulophorus*

– Branchial fossa with out palps..... *Dero*

5. Specially elongated hair setae absent; no sensory papillae..... *Nais*

Genus ***Branchiodrilus*** Michaelsen, 1900

1890. *Chaetobranchus* Bourne, *Ouart. jl. Microsc. Sci*, (N.S.) pp. 83-89, pl. XII.

1900 *Branchiodrilus* Michaelsen, *Ouart. jl. Microsc. Sci,* p. 575; Naidu 1962b, *J. Bomb. nat. Hist. Soc.*, pp. 520-546, Figs. 9-14.

Type species : *Branchiodrilus semperi* (Bourne).

Diagnosis : Prostomium rounded. Paired bronchial processes dorso-laterally placed on many or most of the body segments beginning immediately after the anterior end of the body. Dorsal setae begin in the same segment as the

gills and consisting of hair and needle setae; ventral setae bifid crotchets.

1. ***Branchiodrilus semperi*** (bourne, 1890)

1890. *Chaetobranchus sempari* Bourne, *Ouart. jl. Microsc. Sci*, (N.S.) : 83-89, pl. XII.

1900. *Branchiodrilus semperi* Michaelsen, *Ouart. jl. Microsc. Sci.*, (N.S.) p. 575; Naidu 1962b, *J. Bomb. nat. Hist. Soc.*, pp. 520-546, Figs. 9-14.

Material examined : An 3592/1, 5 ex., Nagar Kera (Bellary district), 28.iii.2007, Coll. T. Biswas & party; An 3593/1 1 ex., Basanta Kunta (Bellary district), 29.iii.2007, Coll. T. Biswas & party.

Diagnosis : Worm large, brownish with transverse pigmented bands in anterior part of body only. Prostomium bluntly conical. Gills dorso-lateral, one pair in each of the anterior 40-50 segments beginning from II segment, the five or six pairs a little shorter, gradually increasing in length after 20th segment, after which become shorter until they become mere warts; length of the largest gill is several times the diameter of the body; gills are hollow projections of the body wall. Ciliated, each having a loop of the dorsal blood vessel. Dorsal setae from V or VI and 1-3 needle setae per bundle. Hair setae smooth, needle setae without nodules, simple pointed, straight in anterior segments with a peculiar bayonet shaped distal curve. Ventral setae starts from the II segment, 4-6 per bundle, bifid crotchets, outer prongs of which being twice the length of the inner, while in hind segments of the inner being twice the length of the outer. Nephridium begins at XII segment. Budding zone seen one at a time.

Habit : Mud dwellers; not swimming.

Distribution : India : Karnataka–Bellary Simoga districts; Andhra Pradesh, Tamilnadu, West Bengal, Uttar Pradesh; Madhya Pradesh; Punjab; Bihar, Assam.

Elsewhere : Dhaka; Myanmar; Sri Lanka; South and East Asia.

Genus ***Aulophorus*** Schmafda, 1861

1861. *Aulophorus* Schmarda, *Neue Wilbelose Thiere, Oligochaeta.*, : 51-56; Stephenson 1923, *Fauna Brit. India,* pp. 518, 262 pl; Brinkhurst 1971, *Univ. Queensland Papers* : 99-128.

Type species : *Aulophorus furcatus* (Muller, 1773).

Diagnosis : Dorsal setae start from IV, V or VI segment; ventral setae of II to V segment may or may not be different from the following segment. Posterior border or branchial fossa projecting into two palps. Coelomocycles may or may not be present. Pineal setae absent usually.

2. ***Aulophorus furcatus*** (Muller, 1773) (Fig. 1)

1773. *Nais furcata* Muller, *Helminth. Hav.Lipsiae*, pp. 1-214; Khatoon and Ali 1993 : 531-534.

Material examined : An 3594/1, 1 ex., Nandingud (Mysore district), 25.iii.2007, Coll. T. Biswas & party.

Diagnosis : Worm of medium size, pale brown

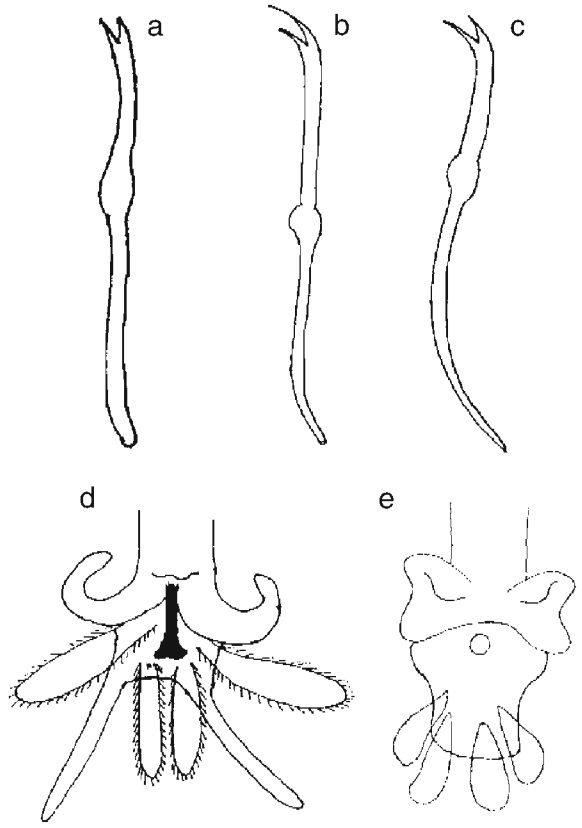

Fig. 1. Identification features of *Aulophorus furcatus* (Muller, 1773). a. Needle seta; b. Ventral seta (II Segment); c. Ventral Seta (V & VI Segment); d. Nephredium relaxed; e. Nephridium contracted.

in colour. Prostomium bluntly conical with stiff eilia on margin. Dorsal setae from V, 1-2 hair and 1-2 needle setae per bundle. Hair setae smooth, slightly curved. Needle setae 50-64 ìm long, with distal nodulus, distal tooth thinner about equal to straight than proximo ventral setae 3-5 per bundle decreas to 2-3 posteriorly; in II-IV, 54-76 ìm long, slender, less curved with median nodules, teeth equally thick, distal nearly twice as long as proximal in rest 53-68 ìm long, more curved, which with distal nodulus, distal tooth shorter and thinner than proximal. Lengths and thickness of seta, length of distal tooth and position of nodulus vary from seta to seta in a bundle. Branchial fossa cup-shaped with a pair of non contractile palps. Clitellum in V-VII, weak between male pores.

Habits : Worms like portable mucus tubes covered with foreign matter, burying anterior part of body in mud, keeping posterior part and branchial fossa protruded in water. Swims with brisk transverse horizontal movements.

Distribution : Karnataka–Bellary, Bangalore, Mysore, West Bengal, Kerala, Chennai, Maharashtra, Madhya Pradesh, Andhra Pradesh, Delhi, Punjab, Haryana, Srinagar, Bihar.

Elsewhere : Dhaka; Myanmar; Sri Lanka; Cosmopolitan

Genus ***Dero*** Oken, 1815

1815. *Dero* Oken, Fleisch. Their.Leipzig, pp. 313-363; Naidu 1962b, *J. Bomb. Nat. Hist. Soc.*, pp. 520-546, Figs. 9-14; Mukhopadhaya 1998, *Zool. Surv. India* : 95-123.

Diagnosis : Eye absent. Dorsal setae from either IV to V segment onwards, consisting of hairs and doubled pronged pectinate or palmate needles. Ventral setae of II to V segment different from the rest, having the distal teeth longer than the proximal but equally thick, compared with equally long or short but thinner in later segment. Pharynx in II to V segment with Pharangeal glands. Nephredia invested with peridoneal cells in some usually tube dweller.

Type species : *Dero digitata* (Muller, 1773).

Stephenson (1923, 1930), Marcus (1943) Chekanoskaya (1962) treated Dero and *Aulophorus* as distinct, separate genere. And Liang(1964) bestowed generic status to *Allodero*. In the present work they are treated as distinct genera.

Key to the species of genus *Dero* known from the area of study

1. Dorsal setae begin from IV segment..... ..... *D. zeylanica*
– Dorsal setae begin from VI segment.....2
2. Needle teeth unequal, distal tooth longer than proximal..... *Dero digitata*
– Needle teeth equal and short ..*Dero cooperi*

3. ***Dero cooperi*** Stephenson, 1932 (Fig. 2)

1852a. *Dero limosa* Leidy, *Proc. Acad. Nat. Sci.* : 224-227.

1932. *Dero cooperi* Stephenson, don, pp. 227-256, 18 figs; Mukhopadhaya 1998, *Zool. Surv. India.* : 95-123.

Material examined : An 3595/1, 2 ex., Kooknalekere (Mysore dist.,), 24.iii.2007, Coll. T. Biswas & party; An 3596/1, 1ex., Kudli village pond (Simoga dist.,), 26.iii.2007, Coll. T. Biswas & party.

Diagnosis : Size small, 10 mm. pale red. Prostomium with sensory hairs. Dorsal setae start from V segment having one hair and one needle per bundle; hair bayonet shaped smalaler than body diameter; needle-sickle shaped with distal nodules befit with short but equal teeth; ventral setae from II segment, those of II to V 4-5 per bundle straighter, thinner and longer with proximal nodule. Bronchial fossa having anterior margin flat and broad, posterior margin prolonged into convex lip; gill 4 pairs, one pair dorsal, one pair lateral and two pairs ventral. Clitellum cover V to VII segment. Nephridium starts in VII segments. Branchal fossa having anterior margin flat and broad, posterior margin prolonged into convex tip; gill 4 pairs, one pair dorsal, one pair lateral and few pairs ventral clitellum covers V to VII segment. Nephridum starts in VII segment.

Habits : Worms like in tubes of mucous, sand

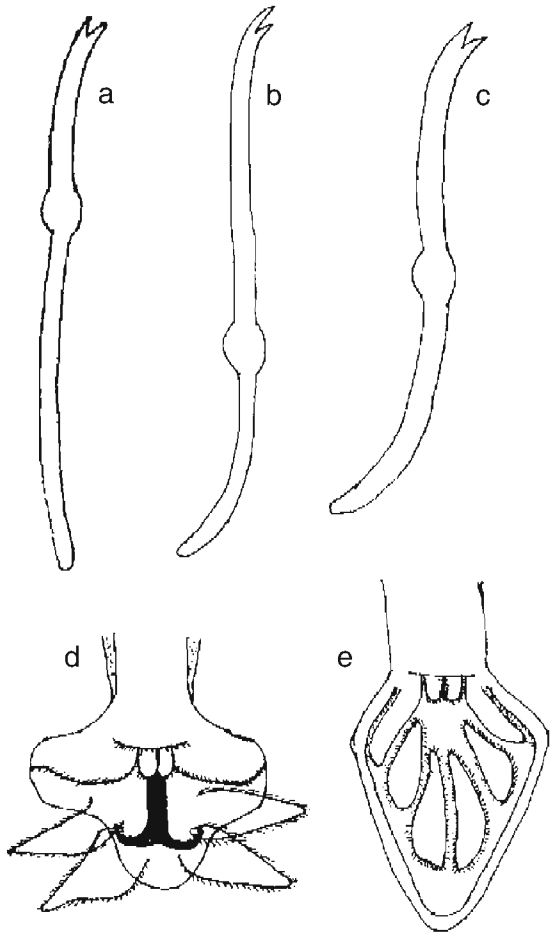

Fig. 2. Identification features of *Dero cooperi* Stephenson, 1932. a. Needle seta; b. Ventral seta (II Segment); c. Ventral Seta (middle); d. Bronchial fossa relaxed; e. Bronchial fossa contracted.

and mucous, protruding either end from the tubes. Swim with spinal movement.

Distribution : Karnataka–Bellary, Bangalore, Andhra Pradesh. Simoga, Maharashtra, Uttar Pradesh, Punjab, West Bengal, Kerala, Delhi.

Elsewhere : Lahore, Sri Lanka; Africa, Italy, Germany, south America.

4. ***Dero digitata***

1773. *Nais digitata* Muller, *Helmenthica Havniae Lipsiae* : 1-214.

1914b. *Dero limosa* Stephenson, Rec. India. Mus., pp. 321-365, Figs. PXXXVI; Singh 1989, *Proc. Nat. Acad. Sci.*, : 271-277.,

1975. *Dero (Dero) digitata* Ali, Bangladesh *J. Zool.*, : 55-61.

Material examined : An 3597/1, 2 ex., Nandingud (Mysore dist.), 24.iii.2007, Coll. T. Biswas & party; An 3598/1, 1 ex., Nagerkere (Bellary dist.,), 28.iii.2007, Coll. T. Biswas & party.

Diagnosis : Worms medium size tube-dwelling, reddish, epidermis with uniform orange red pigment more concentrated in head segment. Prostomium bluntly triangular with stiff sensory cilia on margin. Dorsal bundles from VI, each with 1 hair setae, slightly bayonet shaped, and 1 bifid needle seta with distal nodules and outer tooth longer and slightly thinner than inner tooth. Ventral setae of II-V, 4-5 per bundle, thin less curved than others with proximal nodules teeth equally thick distal 1½ times as long as proximal. In other 2-4 per bundle, with distal nodules, distal tooth about equal or slightly shorter and thinner than proximal. Branchial fossa with antero-dorsal margin entire convex and ciliated and a postero-ventral margin prolonged into a non-ciliated rounded lip. Gills 4 pairs, 1 pair dorsal and small, 1 pair lateral and 2 pairs ventral, all foliate. Clitellum in V-VII segments.

Habits : Lives in tubes of mucus and sand in freshwater. Swim with spiral movement.

Distribution : Karnataka– Bangalore, Mysore, Bellary, Kerala, Tamilnadu, Madhya Pradesh, West Bengal, Andhra Pradesh, Punjab.

Elsewhere : Dhaka; South and East Asia; Europe; south America; Australia

1. ***Dero zeylanica*** Stephenson, 1913 (Fig. 3)

1913b. *Dero zeylanica* Stephenson, pp. Spol. Zeylan Colombo, 251-276; pl. I-II; Naidu and Naidu 1981a, *J. bomb. nat. Hist. soc.*, pp. 524-538, Fig. 58; Mukhopadhaya 1998, *Zool. Surv. India.* : 95-123.

Material examined : An 3599/1, 2 ex., Kurenj lake (Mysore dist.), 25.iii.2007, Coll. T. Biswas & party; An 3600/1, Lalbagh (Bangalore dist.,), 21.iii.2007, Coll. T. Biswas & party.

Diagnosis : Size small, light brown. Prostomium bluntly triangular with stiff cilia on margin. Dorsal setae begin from VI segment, each bundle having 2 hairs and 2 needles or 3 of each

in every bundle or 3 2 or 1 of each in anterior, middle and posterior segment respectively; hairs long, bayonet shaped with distal nodules; ventral setae 4-6 per bundle, bifid crotchets nodules distal; in II to V segment setae 4-5 per bundle, thinner and straighter, nodules median and diverging teeth. Branchial organ with flat anterior and posterior margin; 4 pairs pf gills. foliate. One pair dorsal; one pair ventral and 2 pairs lateral. Nephridium begins with VII segment. Clitellum includes V-VII segment.

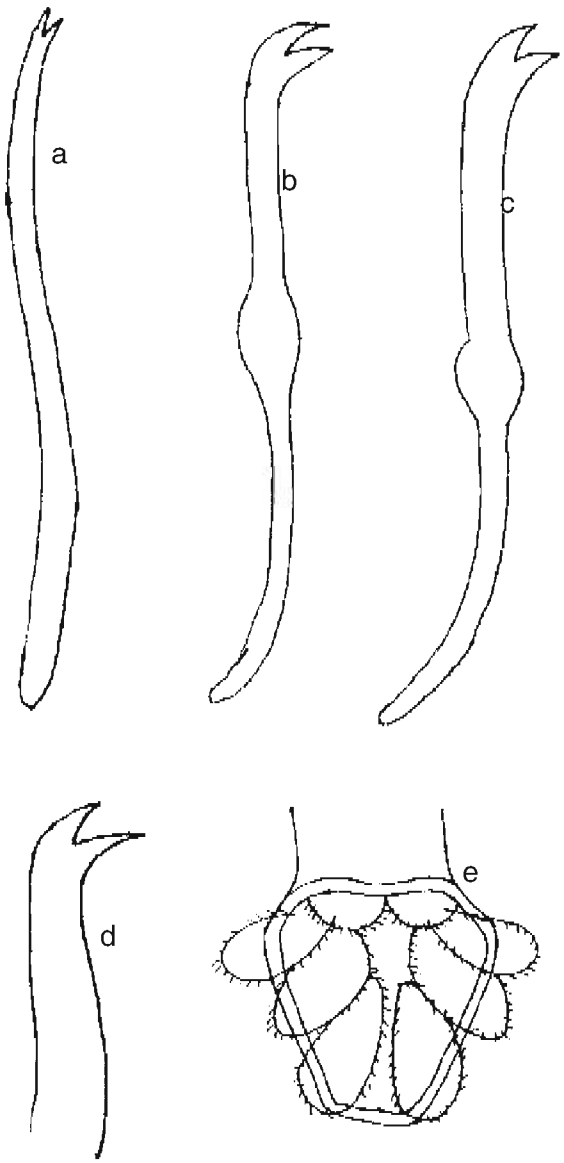

Fig. 3. Identification features of *Dero zeylanica* Stephenson, 1913. a. Needle seta; b. Ventral seta (II Segment); c. Ventral Seta (VI Segment); d. Distal end of Ventral Seta of Posterior segment; e. Bronchial foss.

Habit : Lives in soft mud along with other species of Naididae; rarely in tubes; swim by slow spiral movement.

Distribution : Karnataka–Bangalore, Bellary, Simoga. Tamilnadu, Andhra Pradesh, Maharashtra, Uttar Pradesh, Punjab, West Bengal, Meghalaya.

Elsewhere : Bangladesh, Kandy Srilanka; Asia; Brazil

Nais Muller, 1773

1773. *Nais* Muller, *Helmenthica Havniae Lipsiae* pp. 23-24; Brinkhurst 1971, Univ. Queensland Papers, pp. 99-128; Mukhopadhaya 1998, *zool. Surv. India.* : 95-123.

Type species : *Nais barbata* Muller

Diagnosis : Prostomium simple, rounded hind end simple, Dorsal setae beginning in V segment consisting of moderately ling hair setae and simple or bifid needles. Ventral bundles consisting of double pronged crotchets, those to II to V segment well differentiated from those of the following segment. Pharynx in II and III segment. Pharyngeal and esophageal gland present. Clitellum includes segments V to VII. Pineal setae present.

6. ***Nais andherensis*** Naidu and Naidu, 1981a

1962. *Nais menoni* Naidu, *J. bomb. Nat. Hist. Soc.* : 113-118, Fig. 19.

1981b. *Nais andherensis* Naidu and Naidu, *J. bomb. Nat. Hist. Soc.*, :113-118. fig. 19.

Nais andherensis Naidu and Naidu, 1981 a some freshwater aquatic Oligochaeta from Nilgiris, South India Hydrobiol. 76 : 113-118, 19 figs.

Material examined : An 3601/1, 3 ex., Lalbagh (Bangalore dist.), 20.iii.2007, Coll. T. Biswas & party; An 3602/1, 2 ex., Karenj Lake (Mysore dist.,) 25.iii.2007, Coll. T. Biswas & party; An 3603/1, 5 ex., Krishna river (Bellary dist.,) 29.iii.2007, Coll. T. Biswas & party; An 3604/1, 3 ex., Nandingud (Mysore dist.,), 25.iii.2007, Coll. T. Biswas & party

Diagnosis : Worm small and slender, prostomium bluntly triangular with stiff sensory cilia on outer margin. Dorsal setae from V, 1 hair

setae and 1 needle setae per bundle. Hair setae ling and needle setae bifid sickle-shaped with distal nodules, teeth equally thick, distal straight and longer than proximal. Ventral setae in II-V 2-4 per bundle less curved, long with proximal to middle nodules, distal tooth 1½ times as long as proximal ventral setae in II-V per bundle less curved, long with proximal, in rest 2-6 per bundle 43-50 µm long with distal nodules and teeth equally thick and distal longer than proximal.

Habits : Worms live in freshwater and swim with brisk spiral movement.

Distribution : Tamilnadu, Andhra Pradesh, Karnataka.

Elsewhere : Sri Lanka; Known only in Indian sub continent.

Subfamily RHYACODRILINAE

Diagnosis : Prostate diffuse when present Coelomocytes present, usually abundant, spermatophores present or absent.

Genus ***Branchiura*** Beddard, 1892

1892. *Branchiura* Beddard,. pp. 325; Brinkhurst and Jamieson 1971, Aquatic Oligochaeta of the World : 860, Fig. 1.1-15.14; Mukhopadhaya 1998, Zool. Surv. India : 95-123.

Diagnosis : Dorsal bundle with hair setae along with single pointed or bifid crotchets. Posterior segment with paired gill on dorsal and ventral sides.

Distribution : India.

Elsewhere : Africa; Pakistan; Great Britain; Ireland; France; Germany; Japan; China; North and South America.

Type species : *Branchiura sowerbyi* Beddard, 1892.

7. ***Branchiura sowerbyi*** Beddard, 1892

1892. *Branchiura soweerbyi* Beddard, *Quart. Jl. Microsc., Sci.* (N-S) pp. 325-340; Naidu and Naidu, 1981a, *J. bomb. Nat. Hist. Soc.,* : 524-538, Fig. 58.

Material examined : An 3605/1, Nagerkere (Bellary dist.,) 29.iii.2007, Coll. T. Biswas & party; An 3606/1, 7 ex., Krishna river (Raichur dist.,) 30.iii.2007, Coll. T. Biswas & party. An 3607/1, 10 ex., Nandingud (Mysore dist.,), 25.iii.2007, Coll. T. Biswas & party.

Diagnosis : Size large 50-80 mm; robust, dark brown. Posterior third with hollow mid-dorsal and mid-ventral gill serially arranged a pair per segment, gradually increasing in length to a length of the widest diameter of the body, about 50-150 pair; these arecontractile and each enclose on it a vascular loop. Dorsal bundle of setae begin in II segment, having 2-4 hairs and 2-6 crotchets per bundle; having bayonet shaped, longest anteriorly, decreasing gradually in the branchial region; crotchets bifid with proximal prongs longer than distal, ventral setae 4-6 per bundle anteriorly, 1-2 posteriorly nodules distal, simple pointed or bifid sometime pectinate. Clitellum covers X-XII segment.

Habits : Worms live in clayey slit at bottoms of tanks, lakes, canals and even drains along with *Limnodrilus hoffmusteri* when disturbed coil then to spiral immediately.

Distribution : Kerala, Chennai, Tamilnadu, Karnataka, Maharashtra, Madhya Pradesh, Uttar Pradesh, Delhi, Haryana, West Bengal, Assam, Manipur.

Elsewhere : Pakistan, Bangladesh, Sri Lanka; Cosmopolitan.

Subfamily TUBIFICINAE

Diagnosis : Aquatic oligochaeta of moderate size. Length may extent upto 200 mm. pale to deep red. Prostate solid, stalked, and attached to the atria when present. Sperm and spermatophores within the spermathica. Coelomacytes absent, rarely present

Genus ***Limnodrilus*** Claparede, 1862

1862. *Limnodrillus* Claparede, *Mem. Soc. Phys. Hist. nat. Geneve*, : 227-291 pls. I-IV; Brinkhurst and Cook 1966, *Proc. Acad. Nat. Sci. Philad.* : 1-33.

Type species : *Limnodrilus hoffmeisteri*

Diagnosis : Dorsal and ventral bundles of setae

are bifid crotchets of same type. Hair seate absent. Vascular net work in posterior part of the body. Lateral pulsatile hard in VIII segment, testes in X and ovaries in XI segment

Distribution : India.

Elsewhere : Pakistan; Tibet; Ceylon; Japan and N. America

8. ***Limnodrilus hoffmeisteri*** Claparede, 1862 (Fig. 4)

1862. *Limnodrilus hoffmeisteri* Claparede, *Mem. Soc. Phys. Hist. nat. Geneve* : 217-291, I-IV; Mukhopadhaya 1998, *Zool. surv. India,* 95-123.

1912. *Limnodrilus socialis* Stephenson, *Rec. Indian. Mus.,* : 59-77, Fig. 8, pl. VII-VIII.

Material examined : An 3608/1, 6 ex., Kudli village pond (Simoga dist.,) 26.iii.2007, Coll. T. Biswas & party; An 3609/1, 10 ex., Karenj Lake (Mysore dist.,), 25.iii.2007, Coll. T. Biswas & party; An 3610/1, 2 ex. Kaveri river side (Mysore dist.,) 25.iii.2007, Coll. T. Biswas & party.

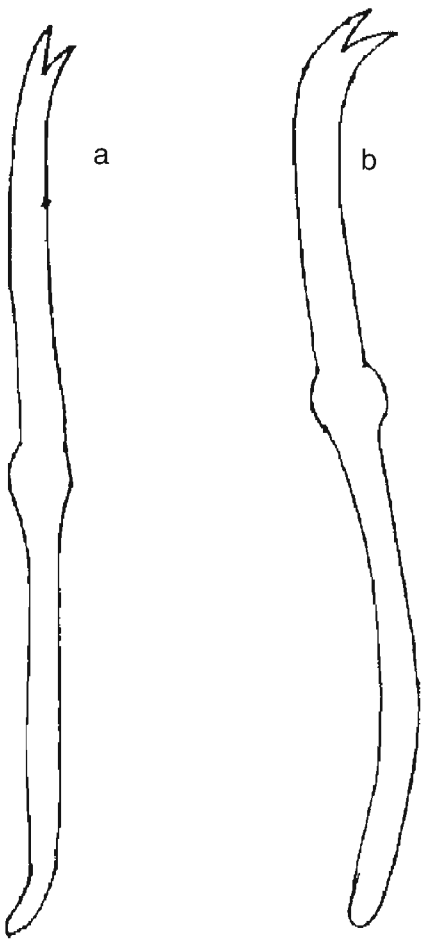

Fig. 4. Identification features of *Limnodrilus hoffmeisteri* Claparede, 1862. a. Dorsal seta; b. Ventral seta

Diagnosis : Size large. 70-80 mm, brown anteriorly and lighter posteriorly. Posterior position whiplike and without setae. Both dorsal and ventral setae start form Ii segment and are bifid crotchets of one type only having prongs equal in length the distal prong thinner; dorsal bundle consisting of 6-7 setae in anterior, 3-5 setae in the middle and 1-2 setae in hind segments thinner and shorter than the setae of the ventral bundles. Clitellum embraces XI-XII segment, opaque white.

Habits : These worms live buried in soft clay or mud in clear, turbid even foul water and perform wavy move out of the hind portion and disappear in the mud the moment they are disturbed.

Distribution : India : West Bengal; Andhra Pradesh; Karnataka, Kerala, Tamilnadu, Andhra Pradesh, Mumbai, Madhya Pradesh, Uttaranchal, Delhi, Punjab, Haryana, West Bengal, Assam.

Elsewhere : Pakistan, Myanmar, Bangladesh, Sri Lanka; Cosmopolitan.

SUMMARY

The paper deals with *Diagnosis*, distribution and key upto the species level of 8 species under 6 genera and 2 families of freshwater aquatic oligochaeta collected from 5 districts of Karnataka viz. Billary, Mysore, Bangalore, Raichur, Simoga. A classified list of freshwater oligochaeta is also incorporated.

ACKNOWLEDGEMENTS

We are thankful to the Director, Zoological Survey of India, Dr. A.K. Sanyal, Addl. Director, (Retd.) Dr. N.C. Nandi, Scientist 'F', (Retd.), Dr. A. Misra, Retd. Scientist 'C', Dr. J. Pattanayak, O/C., General Non-Chordata Section, ZSI for the facilities and necessary help and suggestion provided to us.

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ANNELIDA : LEECHES

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INTRODUCTION

There are more than 667 leech species in the world. In India 63 leech species have been recorded (Bandyopadhyay and Mandal, 2006). Harding and Moore (1927), Soos (1965) is the pioneer in Taxonomy of leeches. Mandal, C.K. (1966, 2002, 2004 and 2006), Nandi, N.C. and Raut, S.K., and (1987) have done some work on taxonomy and ecological work of leeches in West Bengal. Soota, T.D (1977), Chandra, M (1983), Ghosh G.C. (1998) contributed a lot on the taxonomy of leeches.

Mukherjee and Chandra (1988) recorded 5 species from Karnataka. So the present communication deals with 103 examples of leeches collected by the author during May 2006 from the fresh water bodies of Karnataka.10 species have been collected under 8 genus and 3 families. 6 leeches out of 10 are new recorded from this state.

MATERIAL AND METHODS

After making the collection, leeches were sorted out. Then the cleaned leeches were placed in a tray with a small quantity of water and were slowly killed by anaesthetizing with alcohol. Leeches usually die in an extended condition by the process. Just after death, the leeches were kept in 70% alcohol for permanent preservation. As fixing fluid 4% formalin may be used.

I. Family GLOSSIPHONIDAE

1. Genus ***Glossiphonia*** Johnson, 1816

1. *Glossiphonia weberi* Blanchard, 1897

2. Genus ***Hemiclepsis*** Vejdovsky, 1883

*2. *Hemiclepsis marginata asiatica* Moore, 1924

3. *Hemiclepsis marginata marginata* (Muller, 1774)

*4. *Hemiclepsis viridis* Moore, 1927

3. Genus ***Helobdella*** Blanchard, 1896

*5. *Helobdella nociva* Harding, 1924

4. Genus ***Paraclepsis*** Harding, 1924

6. *Paraclepsis praedatrix* Harding, 1924

5. Genus ***Placobdella*** Blanchard, 1893

*7. *Placobdella emydae* Harding, 1920

II. Family ERPOBDELLIDAE

6. Genus ***Herpobdelloidea*** Kaburaki, 1921

8. *Herpobdelloidea lateroculata* Kaburaki, 1921

7. Genus ***Nematobdella*** Kaburaki, 1921

*9. *Nematobdella indica* Kaburaki, 1921

III. Family ERPOBDELLIDAE

8. Genus ***Hirudo*** Linnaeus, 1758

*10.*Hirudo birmanica* (Blanchard, 1894)

1. Genus ***Glossiphonia*** Johnson, 1816

1816. *Glossiphonia* Johnson, Treatise on the medicinal leech, 8* London

Glossiphonia weberi Blanchard, 1897

1897. *Glossiphonia weberi* Blanchard, Zool. Ergeb. Einer Reise in Niederlandische Ost-Indian, Max Weber, **4**: 332 (Type Locality: Sumatra: Type- Deposited: Not known).

1977. *Glossiphonia weberi,* Chandra, *Rec. zool. Surv. India,* **73**(1-4) : 189-195.

Material : 2 ex. Shimoga district, Karnataka,

25.3.2003. Registration number An 3370/1, Coll. C.K. Mandal.

Diagnostic character : Body is ovate-acuminate. It is triangular in contraction. Larger form of bitten rice or Sumatra leech (common name) attains a length of about 12 mm, general colour varies from grayish-white to light orange but usually white in preserved state; five longitudinal rows of dark brown spots; dorsal surface bears seven longitudinal rows of prominent papillae. Dorsal surface is rough due to the presence of tubercles on every ring. Eyes are three pairs on rings 6, 7 and 8; male and female genital ducts open by a common pore between rings 27/28; rings 70; mouth opens within the anterior sucker; crop with six pairs of sub-lobate lateral caeca, the last and the longest pair reflected posteriorly.

Distribution : India : Widely distributed throughout India. Bihar; Uttar Pradesh; Andhra Pradesh; Assam; Tamil Nadu; Orissa; Madhya Pradesh; Jammu and Kashmir. West Bengal, Karnataka.

Elsewhere : Pakistan, Nepal, Burma and Sumatra.

2. Genus ***Hemiclepsis*** Vejdovsky, 1883

1883. *Hemiclepsis* Vejdovsky, *Sitzb. des. Koningl. Bohm. Gesel. Des Wissensch. Prag.,* 35-51.

2. ***Hemiclepsis marginata marginata*** (Muller, 1774)

1778. Hirudo marginata Muller, Vermium terrestrium et fluviatiluem 1 Pars 2.4° Havniel et Lipsie, 1773-1774. (Type Locality and Type-Deposited Not known).

1976. *Hemiclepsis marginata marginata,* Chandra, *Rec. zool. Surv. India,* **69** : 325-328.

Material : 1 ex. Karanji lake, District Mysore, Karnataka, 22.3.2003. Registrtion number AN 3494/1, Coll. C.K. Mandal.

Diagnostic characters : The common name is Pigmented leech. It is flattened and claviform in shape; ground colour light-yellow, profusely sprinkled above with bright green but this green colour disappears in preserved state; lemon-yellow spots arranged in seven longitudinal rows on dorsal surface; 72 rings; eyes two pairs; male pore and female pore open between rings 29/30 and 31/32 respectively.

Distribution : India : Bihar; Orissa; Rajasthan; Uttar Pradesh; Maharashtra; Madhya Pradesh; Karnataka; Andhra Pradesh; Tamil Nadu; West Bengal, Karnataka.

Elsewhere : Europe, Western Asia and Nepal.

Remarks : *Hemiclepsis marginata marginata* has been recorded from Karnataka for the first time. Average length is 22 mm. at rest.

3. ***Hemiclepsis marginata asiatica*** Moore, 1924

1924. *Hemiclepsis marginata asiatica,* Moore, *Proc. Acad. Nat. Sci., Philad.* **76** : 343-388. (Type Locality : Srinagar, Kashmir; Type-Deposited: Z.S.I.).

Material : 2 ex. Karanji lake, District Mysore, Karnataka, 22.3.2003. Registrtion number AN 3495/1, Coll. C.K. Mandal. 3ex. District Shimoga, Karnataka, 25.3.2003. Registrtion number AN 3337/1, Coll. C.K. Mandal.

Diagnostic characters : Larger forms attain a length of about 15 mm., width of about 4 mm., colour pinkish white with dull green pigmented cells on the dorsal side; body smooth ventrally but rough dorsally; middle ring of each somite bears three pairs of larger dorsal paillae; eyes three pairs arranged in two sub-parallel columns; the first, second and third pairs of eyes lie on ring 3, 4 and 7 respectively; male and female pores open between 29/30 and 31/32 respectively rings 73 mouth subterminal; crop with nine pairs of lateral diverticula.

Distribution : India : Sirmour, Solan, Bilaspur (Himachal Pradesh); Kalka (Haryana); Chota Nagpur (Bihar) Mangaldai (Assam); Jodhpur, Nagaur, Jaisalmer, Jaipur, Bikaner, Sikar (Rajasthan), Igatpuri, Kolhapur, Satara (Maharashtra); Andhrapradesh; Assam; Himachal Pradesh; Rajasthan; Shimoga (Karnataka); West Bengal.

4. ***Hemiclepsis viridis*** Chelladurai 1934

1934. *Hemiclepsis viridis* Chelladurai, *Rec. Indian Mus.*, **36** : 345-352. (Type Locality: Travancore, Kerala: Type-Deposited: Z.S.I.).

Material : 1 ex. Kuknalikere, District Mysore, Karnataka, 28.3.2003. Registrtion number AN 3368/1, Coll. C.K. Mandal.

Diagnostic characters : The body is ovate-lanceolate, head is faintly dilated. The dorsal surface bears fifteen bright pea-green longitudinal subparallel lines composed of numerous closseset pigment spots. Three pairs of eyes in two sub-parallel rows on rings 3, 4 and 6. Mouth opening within the oral sucker.

Distribution : India : Trivandrum, Kerala, Mysore, Karnataka.

Remarks : *Hemiclepsis viridis* has been recorded from Karnataka for the first time.

3. Genus ***Helobdella*** Blanchard, 1896

1924. *Helobdella* Blanchard, *Boll. Mus. Zool. Torino*, XI, No. 263.

5. ***Helobdella nociva*** Harding, 1924

1924. *Helobdella nociva* Harding, *Ann. Mag. Nat. Hist., Ser.* 9, **14** : 489. (Type Locality and Type- Deposited Not known).

Material : 1 ex. Kuknalikere, District Mysore, Karnataka, 28.3.2003. Registration number AN 3369/1, Coll. C.K. Mandal.

Diagnostic characters : The common name is Claviform leeches. Larger forms attain a length of about 7.5 mm. and the greatest width about 1.5 mm. Body translucent, dull green but usually white in preserved state; dorsal surface with five brown longitudinal stripes; papillae two pairs on dorsal side; eyes one pair on ring 4; male and female ducts open between 28/29 and 30/31 respectively; 70 rings; mouth opens within anterior sucker; crop with six pairs of simple lateral caeca. Male and female genital pore separated by two annuli.

Distribution : India : Solan (Himachal Pradesh); Puri (Orissa); Poonch, Udhampur, (Jammu and Kashmir) Bankura, Calcutta, Howrah, Medinipur, Purulia, South 24 Parganas, Murshidabad and Jalpaiguri (West Bengal) Mysore (Karnataka).

Remarks : *Helobdella nociva* has been recorded from Karnataka for the first time.

4. Genus ***Paraclepsis*** Harding, 1924

1924. *Paraclepsis* Harding, *Ann. & Mag. Nat. Hist., Ser.*, **9, 14** : 489.

6. ***Paraclepsis praedatrix*** Harding, 1924

1924. *Paraclepsis praedatrix* Harding, *Ann. & Mag. Nat. Hist., Ser.*, **9, 14** : 489. (Type Locality and Type-Deposited Not known).

1983. *Paraclepsis praedatrix* Chandra, *Rec. zool. Surv. India*, **80** : 279.

Material : Not collected during this survey.

Diagnostic characters : Body ovate- acuminate. Total number of rings 73. Three pairs of eyes are disposed in two sub-parallel rows in rings 3,4 and 7. Male gonopore between ring 29 and 30.

Distribution : India : Sirmour, Solan, Bilaspur (Himachal Pradesh); Kalka (Haryana); Chota Nagpur (Bihar) Mangaldai (Assam); Jodhpur, Nagaur, Jaisalmer, Jaipur, Bikaner, Sikar (Rajasthan), Igatpuri, Kolhapur, Satara (Maharashtra); Andhrapradesh; Assam; Himachal Pradesh; Rajasthan; Shimoga (Karnataka); Bankura, Burdwan, Howrah, Medinipur, Murshidabad, Purulia (West Bengal).

5. Genus ***Placobdella*** Blanchard, 1893

1893. *Placobdella* Blanchard, *Bull. Soc. Zool. France*, **17** : 93.

7. ***Placobdella emydae*** Harding, 1924

1920. *Placobdella emydae,* Harding, *Mem. Indian Mus.*, **5** : 510. (Type Locality and Type- Deposited Not known).

1983. *Placobdella emydae,* Chandra, *Rec. zool. Surv. India*, **80** : 277.

Material : 1 ex. Kuknalikere, District Mysore, Karnataka, 28.3.2007. Registrtion number AN 3367/1, Coll. C.K. Mandal.

Diagnostic characters : The common name is Indo Burman leech. Larger forms attain a length

of about 14.2 mm. and breadth about 9.1 mm.; Translucent, elliptic body with head region dilated; colour grayish-green; three pairs of papillae on dorsal surface, intermediate pair being largest; male and female pores open between rings 26/27 and 28/29 respectively; rings 71; anterior sucker with a shallow anterior cup; mouth opening terminal.

Distribution : India : Solan (H.P.); Chota Nagpur (Bihar); Sambalpur, Chilka Lake (Orissa); Hoshangabad, Nagpur, Satara (Maharastra); Calcutta, Hughly, Jalpaiguri, Purulia, 24 Parganas North, 24 Parganas South, Howrah, Nadia (West Bengal); Mysore (Karnataka).

6. Genus ***Nematobdella*** Kaburaki 1921

1921. *Nematobdella* Kaburaki, *Rec. Indian Mus.*, **22** : 689-719.

8. ***Nematobdella indica*** Kaburaki, 1921

1921. *Nematobdella indica* Kaburaki, *Rec. Indian Mus.*, **22** : 689-719. (Type Locality: Dharmapur, Himachal Pradesh; Type- Deposited Z.S.I.).

1983. *Nematobdella indica* Chandra, *Rec. zool. Surv. India*, **80** : 281.

Material : 5 ex. Nandinguda, District Mysore, Karnataka, 23.3.2007. Registrtion number AN 3364/1, Coll. C.K. Mandal.

Diagnostic characters : The common name is worm leech of Dharmapura, Himachal Pradesh. Larger forms attain a length of about 20 mm and width about 3 mm; form very slender, attenuated anteriorly; colour bright buff when alive but fades away in preserved state; eyes six pairs, the first pair larger and dorsal on somite III, remaining five pairs smaller, sub-marginal on somites V to XI; gonopores separated by five annuli.

Distribution : Himachal Pradesh; Madhya Pradesh; Maharashtra; Rajasthan and Uttar Pradesh; Renuka, Simla hills, Srimour (H.P); Punjab, Madhya Pradesh and Maharashtra. Howrah; Hughly; Medinipur; Burdwan; 24 Parganas; Nadia; South Dingjur, Jalpaiguri, Coochbehar, Birbhum (West Bengal); Mysore, (Karnataka).

7. Genus ***Herpobdelloidea*** Kaburaki, 1921

1921. *Herpobdelloidea* Kaburaki, *Rec. Indian Mus.*, **22** : 668-719.

9. ***Herpobdelloidea lateroculata*** Kaburaki, 1921

1921. *Herpobdelloidea* Kaburaki, *Rec. Indian Mus.,* **22** : 668-719. (Type Locality: Saugar, Madhya Pradesh; Type-Deposited Z.S.I.).

1983. *Herpobdelloidea lateroculata* Chandra, *Rec. zool. Surv. India*, **80** : 281.

Material : 5 ex. Nandinguda, District Mysore, Karnataka, 23.3.2007. Registration number AN 3373/1, Coll. C.K. Mandal.

Diagnostic characters : The common name of the leech is Worm leech of Saugor, Madhya Pradesh. Larger forms attain a length of about 27 mm and width of about 3 mm; form very slender, attenuated anteriorly; colour pale buff when alive but generally white in preserved state; eyes five or six pairs, the first pair larger and dorsal on somite IV; the remaining submarginal on somites V to VIII; gonopores separated by two and one-half to three annuli.

Distribution : India : Saugor (Madhya Pradesh); Loktak Lake (Manipur); Assam, Nagaur (Rajasthan); Satara (Maharastra); Uttar Pradesh; Cuttack (Orissa); Calcutta; Hughly; Medinipur; Burdwan; Birbhum; Bunkura; South 24 Parganas; North 24 Parganas. Nadia; Malda; Murshidabad; Jalpaiguri; Coochbehar, West Dinajpur (W.B.), Mysore (Karnataka).

8. Genus ***Hirudo*** Linnaeus 1758

1758. *Hirudo* Linnaeus, Systema Nature, 10th ed.

10. ***Hirudo birmanica*** (Blanchard, 1894)

1894. *Haemopis birmanica* Blanchard, *Annuli. Mus. Civ. Stor. Nat Giacomo Doria*, **2**(14) : 113-118. (Type Locality: Kareni Mountains, Burma; Type- Deposited : Genova Museum).

1983. *Hirudo birmanica,* Chandra, *Rec. zool. Surv. India*, **80** : 283.

Material : Not collected during this survey.

Diagnostic characters : Length in life from 5 cm to 7 cm long, slender and small headed. Colour olive brown. Eyes arranged as usual but small.

The first three pairs of eyes on contiguous annuli, the fourth pair separated by one annuli and the fifth by two.

Distribution : India : Dehradun and Bilaspur Himachal Pradesh; Mukteswar, Nainital Uttar Anchal; Sikkim; Manipur; Bhubaneswar Orissa; Assam; Naga Hills Nagaland; Darjeeling, Bunkura, Calcutta, Coochbehar, South 24 Parganas, Calcutta West Bengal; Chikmagalur, Jammu; Lohardanga, Chota Nagpur Bihar; Andhra Pradesh; Mysore Karnataka.

Elsewhere : Sri Lanka; Siam; Bankok; Pakistan; Nepal; Afghanistan and Iran.

ACKNOWLEDGEMENTS

I am gratefull to the Director, Zoological Survey of India, Dr. N.C. Nandi, Scientist 'F', and O/C., F.P.S. Building and Dr. A. Misra, Retired Scientist C., General Non-Chordata Section, ZSI for lucid suggestions during the study of the earthworms, and our special thanks to Dr. J.G. Pattanayak O/C General Non-Chordata Section for critical going through our manuscript. And deep gratitude to the officers and staffs, General Non-Chordata section for their valid suggestions.

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CRUSTACEA : CLADOCERA

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INTRODUCTION

Sharma & Michael (1987) reviewed the taxonomic studies on freshwater Cladocera from India and reported 93 species belonging to 37 genera under 8 families. In the Fauna of Indian Cladocera, Michael and Sharma (1988) reported 90 species of Cladocera from India. From Karnataka only the following four species are reported by them, namely *Ceriodaphnia cornuta., Daphnia carinata, Daphnia cephalata* and *Simocephalus vetulus.* Raghunathan (1989) reviewed the work on Indian Cladocera and reported 106 species from India. In the state of the art published by Zoological Survey of India on Animal Resources of India, Sharma (1991) reported 39 species of Cladocera from Karnataka. Raghunathan & Sureshkumar (2003) provided a checklist of Indian Cladocera with 190 species belonging to 49 genera under 10 families. With reference to Karnataka state, the following contributions are important namely Daday (1911), Brehm (1953), Patil & Gouder (1982,1985), Raghunathan (1988) and Raghunathan & Rane (2001).

SYSTEMATIC LIST

Family SIDIDAE

1. *Pseudosida bidentata* Herrick, 1884
2. *Latonopsis australis* Sars, 1888
3. *Diaphanosoma excisusm* Sars, 1885
4. *Diaphanosoma sarsi* Richard, 1895

Family DAPHNIIDAE

5. *Ceriodaphnia cornuta* Sars, 1885
6. *Ceriodaphnia laticaudata* P.E. Muller, 1867
7. *Ceriodaphnia quadrangula* (O.F. Muller, 1776)
8. *Simocephalus vetulus* (O.F. Muller, 1776)

Family MOINIDAE

9. *Moina micrura* Kurz, 1874
10. *Moina brachiata* (Jurine, 1820)
11. *Moinadaphnia macleayi* (King, 1853)

Family BOSMINIDAE

12. *Bosmina longirostris* (O.F. Muller, 1776)
13. *Bosminopsis deitersi* Richard, 1895

Family MACROTHRICIDAE

14. *Macrothrix spinosa* King, 1853
15. *Echinisca triserialis* (Brady, 1886)
16. *Echinisca odiosa* (Gurney, 1907)

Family CHYDORIDAE

Subfamily CHYDORINAE

17. *Pleuroxus aduncus* (Jurine, 1820)
18. *Pleuroxus similis* Vavra, 1900
19. *Chydorus faviformis* Birge, 1893
20. *Chydorus barroisi* Richard, 1894
21. *Chydorus sphaericus* (O.F. Muller, 1776)
22. *Chydorus ventricosus* Daday, 1898
23. *Dunhevedia serrata* Daday, 1898

Subfamily ALONINAE

24. *Alona quadrangularis* (O.F. Muller, 1776)

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25. *Alona reactangula rectangula* Sars, 1862
26. *Alona davidi punctata* (Daday, 1898)
27. *Alona guttata* Sars, 1862
28. *Leydigia acanthocercoides* (Fischer, 1854)
29. *Biapertura karua* (King, 1853)

SYSTEMATIC ACCOUNT

Family SIDIDAE

1. ***Pseudosida bidentata*** Herrick, 1884

1884. *Pseudosida bidentata* Herrick, *Geol and Nat. Hist. Survey Minnesota, Ann Rep.*, **12** : 20. K. fig. 9.

1988. *Pseudosida bidentata*. Michael and Sharma, *Zool. Surv. India. Fauna of India, Cladocera.* : 36-39.

Material : Not collected.

Distribution : Kerala, Pondicherry, Rajasthan, Tamilnadu.

2. ***Latonopsis australis*** Sars, 1888

1888. *Latonopsis australis* Sars, *Forth. Vidensk. Salsk. Christiana.*, **7** : 1-74.

1988. *Latonopsis australis*, Michael and Sharma. *Zool. Surv. India. Fauna of India, Cladocera.* : 41-43.

Material : Not collected.

Distribution : Maharashtra, Rajasthan, Tamilnadu.

3. ***Diaphanosoma excisusm*** Sars, 1885

1885. *Diaphanosoma excisusm* Sars, *Norske, Vidensk, Salsk. Forhandl. Christiana.*, **7** : 1-74.

2007. *Diaphanosoma excisusm*, Raghunathan and Sureshkumar, *Zool. Surv. India. Fauna of Bannerghatta National Park, Conservation Area Series,* **33** : 13-19.

Material : 5 exs, Banuwadi, BRTWLS, 19.ii.99; 5exs, Banuwadi, BRTWLS, 25.ii.99; 5exs, B.R. Hills, BRTWLS, 1.iii.99; 5 exs, K. Gudi, BRTWLS, 22.ix.99; 5 exs Singagatte, BNP, 29.iv.2002; 5exs, Doddanakere, BNP, 2.viii.2002; 5exs, Seegakette, BNP, 15.iii.2003, 5exs, Doddanakere, BNP, 15.iii.2003; 5exs, Jobkhanalla, BNP, 16.iii.200.

Distribution : Assam, Bihar, Karnataka, Kerala, Rajasthan, Tamilnadu, West Bengal.

4. ***Diaphanosoma sarsi*** Richard, 1895

1894. *Diaphanosoma sarsi Richard. Revue Biol. Nord. France,* **6** : 365.

2007. *Diaphanosoma sarsi*. Raghunathan and Sureshkumar, *Zool. Surv. India. Fauna of Bannerghatta National Park, Conservation Area Series,* **33** : 13-19.

Material examined : 5% exs, Pond near B.R. Hills, BRTWLS, 11.iv.2000; 5 exs, Singagatte, BNP, 29.iv.2002; 5exs, Doddanakere, BNP, 2.viii.2002; 5exs, Hutchinagunta, BNP, 5.viii.2002; 5exs, Seegakette, BNP, 15.iii.2003; 5exs, Jobkhanalla, BNP, 16.iii.200.

Distribution : Bihar, Karnataka, Meghalaya, Tamilnadu, Uttarpradesh, West Bengal.

Family DAPHNIIDAE

5. ***Ceriodaphnia cornuta*** Sars, 1885

1885. *Ceriodaphnia cornuta* Sars. *Norske. Vidensk. Selsk. Forhaundl. Christiania*, **8** : 26-28.

2007. *Ceriodaphnia cornuta*. Raghunathan and Sureshkumar, *Zool. Surv. India. Fauna of Bannerghatta National Park, Conservation Area Series*, **33** : 13-19.

Material examined : 5 exs, Kalani Road, BRTWLS, 2.iv.99, 5 exs, Sebinakare, BRTWLS, 4.iv.99; 5 exs, B.R. Hills, BRTWLS, 22.xi.99; 5 exs, Bannerghatta Quarry pool, BNP, 29.iv.2002; 5exs, Doddanakere, BNP, 2.viii.2002; 5exs, Hutchinagunta, BNP, 5.viii.2002; 5exs, Seegakette, BNP, 15.iii.2003; 5exs, Doddanakere, 15.iii.2003; 5exs, Jobkhanalla, BNP, 16.iii.2003.

Distribution : Bihar, Haryana, Karnataka, Kerala, Madhya Pradesh, Meghalaya, Punjab, Rajasthan, Tamilnadu.

6. ***Ceriodaphnia laticaudata*** P.E. Muller, 1867

1867. *Ceriodaphnia laticaudata* P.E. Muller, *Schiodikes. Naturalist. Tidskr.*, **3** : 130, pl. 1. fig. 19.

1988. *Ceriodaphnia laticaudata*, Michael and Sharma. *Zool. Surv. India. Fauna of India, Cladocera.* : 41-43.

Material : Not collected.

Distribution : Kerala, Maharashtra, Rajasthan.

7. ***Ceriodaphnia quadrangula*** (O.F. Muller, 1776)

1758. *Daphnia quadrangular* O.F. Muller. *Lipsiae et. Havniae*, 90.

2007. *Ceriodaphnia quadrangula* (O.F. Muller). Raghunathan and Sureshkumar, *Zool. Surv. India. Fauna of Bannerghatta National Park, Conservation Area Series,* **33** : 13-19.

Material examined : 5 exs, Doddanakere, BNP, 15.iii.2003; 5 exs, Seegakette, BNP, 15.iii.2003; 5 exs, Jobkhanalla, BNP, 16.iii.2003.

Distribution : Karnataka, Kashmir, Ladakh, Tamilnadu.

8. ***Simocephalus vetulus*** (O.F. Muller, 1776)

1776. *Simocephalus vetulus*, O.F. Muller. *Haviniae* : 1-273.

2006. *Simocephalus vetulus*, Raghunathan. *Zool. Surv. India. Fauna of Biligiri Rangaswamy Temple Wildlife sanctuary, Conservation Area series*, **27** : 13-16.

Material : 5 exs, Durugur, BRTWLS, 26.ii.99.

Distribution : Karnataka, Kashmir, Punjab, Rajasthan, Tamilnadu and West Bengal.

Family MOINIDAE

9. ***Moina micrura*** Kurz, 1874

1874. *Moina micrura* Kurz. *Sitzber. K. Acad. Wiss. Wein. Malh. Nat.*, **70** : 13-15.

2007. *Moina micrura* Kurz. Raghunathan and Sureshkumar, *Zool. Surv. India. Fauna of Bannerghatta National Park, Conservation Area Series*, **33** : 13-19.

Material examined : 5 exs, Kalani Road, BTRWLS, 2.iv.99; 5 exs, Sebinakarae, BRTWLS, 4-iv-99; 5exs, Singhaghatta, BNP, 30.iv.2002; 5exs, Hutchinagunta, 5.viii.2002.

Distribution : Bihar, Haryana, Karnataka, Kerala, Punjab, Rajasthan, Tamilnadu.

10. ***Moina brachiata*** (Jurine, 1820)

1820. *Moina brachiata* Jurine. *Histoire. desMonocler, quise trouvent aux environs de Geneve. Paris*, 131-132.

2007. *Moina brachiata* (Jurine). Raghunathan and Sureshkumar, *Zool. Surv. India. Fauna of Bannerghatta National Park, Conservation Area Series,* **33** : 13-19.

Material examined : 5 exs, Singhaghatta, BNP, 30.ivi.2002.

Distribution : Kashmir, Meghalaya, Rajasthan.

11. ***Moinadaphnia macleayi*** (King, 1853)

1853. *Moinadaphnia macleayi* King. *Pap. Proc. R. Soc. Van Diennans Land,* **2** : 243-263.

1988. *Moinadaphnia macleayi* Michael and Sharma. *Zool. Surv. India. Fauna of India, Cladocera.* : 243-263.

Material : not Collected

Distribution : Karnataka, Kerala, West Bengal.

Family BOSMINIDAE

12. ***Bosmina longirostris*** (O.F. Muller, 1776)

1776. *Lynceus longirostris* O.F. Muller. *Havniae*. 76.

2007. *Bosmina longirostris* (O.F. Muller). Raghunathan and Sureshkumar, *Zool. Surv. India. Fauna of Bannerghatta National Park, Conservation Area Series,* **33** : 13-19.

Material examined : 5exs, Doddanakere, BNP, 15.iii.2003; 5exs, Seegakette, BNP, 15.iii.2003.

Distribution : Kashmir, Meghalaya, Tamilnadu, Tripura, West Bengal.

13. ***Bosminopsis deitersi*** Richard, 1895

1895. *Bosminopsis deitersi* Richard. *Mem. Soc. Zool. France,* **8** : 96.

1988. *Bosminopsis deitersi* Michael and Sharma. *Zool. Surv. India. Fauna of India, Cladocera*, : 99-100.

Family MACROTHRICIDAE

14. ***Macrothrix spinosa*** King, 1853

1853. *Macrothrix spinosa* King. *Pap. Proc. R. Soc. Van Diemans Land*, **2** : 256.

2007. *Macrothrix spinosa* King. Raghunathan and Sureshkumar, *Zool. Surv. India. Fauna of Bannerghatta National Park, Conservation Area Series,* **33** : 13-19.

Material examined : 5 exs, Seegakette, BNP, 15.iii.2003.

Distribution : Karnataka, Rajasthan, Tamilnadu.

15. ***Echinisca triserialis*** (Brady, 1886)

1886. *Echinisca triserialis* Brady. *J. Linn. Soc. Zool.*, **19** : 295.

1988. *Echinisca triserialis* Michael and Sharma. *Zool. Surv. India. Fauna of India, Cladocera*, : 109-111.

Material : Not Collected.

Distribution : Kerala, Rajasthan, West Bengal.

16. ***Echinisca odiosa*** (Gurney, 1907)

1907. *Echinisca odiosa* Gurney. *Rec. Indian. Mus.* **1** : 25.

1988. *Echinisca odiosa* Michael and Sharma. *Zool. Surv. India. Fauna of India, Cladocera*, : 111-113.

Material : Not Collected.

Distribution : Bihar, Rajasthan.

Family CHYDORIDAE

Subfamily CHYDORINAE

17. ***Pleuroxus aduncus*** (Jurine, 1820)

1820. *Monoculus aduncus* Jurine. *Histoire des Monoclas. Quise trouvent aux environs de Geneve. Paris.* : 152-153.

2007. *Pleuroxus aduncus* (Jurine). Raghunathan and Sureshkumar, *Zool. Surv. India. Fauna of Bannerghatta National Park, Conservation Area Series,* **33** : 13-19.

Material examined : 5 exs, Seegakette, BNP, 15.iii.2003.

Distribution : Andhra Pradesh, Karnataka, Kashmir, Punjab, Rajasthan, West Bengal.

18. ***Pleuroxus similis*** Vavra, 1900

1900. *Pleuroxus similis* Vavra. *Hamburger Magalhaensische Sammelreise 2, Hamburg.*, : 23-24.

2007. *Pleuroxus similis* Vavra. Raghunathan and Sureshkumar, *Zool. Surv. India. Fauna of Bannerghatta National Park, Conservation Area Series,* **33** : 13-19.

Material examined : 5 exs, Seegakette, BNP, 15.iii.2003.

Distribution : Karnataka, Kashmir, Meghalaya, West Bengal.

19. ***Chydorus faviformis*** Birge, 1893

1893. *Chydorus faviformis* Birge

1988. *Chydorus faviformis* Birge. Michael and Sharma. *Zool. Surv. India. Fauna of India, Cladocera.*, : 111-113.

Material : Not collected.

Distribution : Kashmir, Maghalaya.

20. ***Chydorus barroisi*** Richard 1894

1894. *Pleuroxus barroisi* Richard. *Revue. Biol. Nord. France.* **6** : 375-377.

2007. *Chydorus barroisi* Richard. Raghunathan and Sureshkumar, *Zool. Surv. India. Fauna of Bannerghatta National Park, Conservation Area Series,* **33** : 13-19.

Material examined : 5 exs, Seegakette, BNP, 15.iii.2003.

Distribution : Andhra Pradesh, Karnataka, Kerala, Gujarat, West Bengal, Tamilnadu.

21. ***Chydorus sphaericus*** (O.F. Muller, 1776)

1776. *Lynceus sphaericus* O. F. Muller. *Havniae.* 119.

2007. *Chydorus sphaericus* (O.F. Muller). Raghunathan and Sureshkumar, *Zool. Surv. India. Fauna of Bannerghatta National Park, Conservation Area Series,* **33** : 13-19.

Material examined : 5exs, Doddanakere, BNP, 2.viii.2002.

Distribution : Bihar, Kashmir, Ladakh, Meghalaya, Tamilnadu, Tibet, West Bengal.

22. ***Chydorus ventricosus*** Daday, 1898

1898. *Chydorus ventricosus* Daday. *Termes. Fuzetek.*, p. 28-29, figs. 10a-d.

2006. *Chydorus ventricosus* Daday : Raghunathan and Sureshkumar, *Zool. Surv. India. Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series*, **27** : 15.

Material : 5 exs., Banuwadi, BRTWLS, 19.ii.99, 5 exs., Kadakkinagangandi, BRTWLS, 21.ii.99; 5 exs., Kalani road, BRTWLS, 2.iv.99.

Distribution : Gujarat, Kerala, Rajasthan, Tamilnadu.

23. ***Dunhevedia serrata*** Daday, 1898

1898. *Dunhevedia serrata* Daday. *Termes. Fuzetek.* p. 21 : 32-33.

1988. *Dunhevedia serrata* Daday : Michael and Sharma. *Zool. Surv. India. Fauna of India, Cladocera.*, : 160-161.

Material : Not collected.

Distribution : Karnataka, Tamilnadu.

Subfamily ALONINAE

24. ***Alona quadrangularis*** (O.F. Muller, 1776)

1776. *Lynceus quadrangularis* O.F. Muller. *Havniae.*, : 72-73.

2007. *Alona quadrangularis* (O. F. Muller). Raghunathan and Sureshkumar, *Zool. Surv. India. Fauna of Bannerghatta National Park, Conservation Area Series,* **33** : 13-19.

Material examined : 5exs, Singhaghatta, BNP, 30.iv.2002.

Distribution : Assam, Karnataka, Kerala, Tamilnadu, West Bengal.

25. ***Alona reactangula rectangula*** Sars, 1862

1862. *Alona rectangula* Sars. *Forhandl. Vidensk. Salark. Christiania.* pp. 160.

2007. *Alona rectangula rectangula* Sars. Raghunathan and Sureshkumar, *Zool. Surv. India. Fauna of Bannerghatta National Park, Conservation Area Series,* **33** : 13-19.

Material examined : 5exs, Seegakette, BNP, 15.iii.2003.

Distribution : Gujarat, Karnataka, Kashmir, Ladak, Meghalaya, Rajasthan, West Bengal.

26. ***Alona davidi punctata*** (Daday, 1898)

1898. *Alona punctata* Daday. *Terms. Fiezetek.* **21** : 39-40.

2007. *Alona davidi punctata* (Daday). Raghunathan and Sureshkumar, *Zool. Surv. India. Fauna of Bannerghatta National Park, Conservation Area Series,* **33** : 13-19.

Material examined : 5exs, Seegakette, BNP, 15.iii.2003.

Distribution : Andhra Pradesh, Karnataka, Tamilnadu, West Bengal.

27. ***Alona guttata*** Sars, 1862

1862. *Alona guttata* Sars. *Forhandl. Vidensk. Salark. Christiania*, : 287-289.

2007. *Alona guttata* Sars. Raghunathan and Sureshkumar, *Zool. Surv. India. Fauna of Bannerghatta National Park, Conservation Area Series,* **33** : 13-19.

Material examined : 5exs, Seegakette, BNP, 15.iii.2003.

Distribution : Karnataka, Kashmir, Ladakh, Tamilnadu.

28. ***Leydigia acanthocercoides*** (Fischer, 1854)

1854. *Leydigia acanthocercoides* Fischer. *Bull. Soc. Jmp. Nat. Mose.* **27** : 431-433.

2007. *Leydigia acanthocercoides* (Fischer). Raghunathan and Sureshkumar, *Zool. Surv. India. Fauna of Bannerghatta National Park, Conservation Area Series,* **33** : 13-19.

Material examined : 5 exs, Hutchinagunta, BNP, 5.viii.2002.

Distribution : Gujarat, Karnataka, Kashmir, Rajasthan, west Bengal.

29. ***Biapertura karua*** (King, 1853)

1853. *Biapertura karua* King. *Pap. Proc. R. Soc. Van Diemans. Land,* **2** : 260.

1988. *Biapertura karua* King : Michael and Sharma. *Zool. Surv. India. Fauna of India, Cladocera*, : 207-209.

Material : Not collected.

Distribution : Andhrapradesh, Karnataka, Meghalaya, Tamilnadu, West Bengal.

DISCUSSION

During the present study a total 29 species belonging to 17 genera under 6 families are recorded. Family Chydoridae alone is represented with 13 species. From Biligiri Rangaswamy Temple Sanctuary 6 species belonging to 5 genera under 4 families are reported (Raghunathan, 2006). Studies from Bannerghatta National Park revealed the presence of 17 species of Cladocera belonging to 9 genera under 6 families.(Raghunathan & Sureshkumar, 2006) From earlier studies on Coorg district of Karnataka, 14 species of Cladocera belonging to 8 genera under 6 families are reported (Raghunathan, 1988). Raghunathan & Rane (2001) recorded 17 species belonging to 14 genera under 5 families from Karnataka part of Nilgiri Biosphere Reserve. Hence a total of 41 species belonging to 19 genera under 6 families are available in Karnataka.

ACKNOWLEDGEMENTS

The author is grateful to the Director, Zoological Survey of India, Kolkata and to the Officer-in- Charge, Zoological Survey of India, Chennai for encouragement and facilities.

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Patil, C.S. and Gouder, B.Y.M. 1982. Freshwater fauna of Dharwad (India). Cladocera. *Jour.Karnatak Sci.*, **27** : 115-126.

Patil, C.S. and Gouder, B.Y.M. 1985. Ecological study of freshwater zooplankton of a subtropical pond (Karnataka state) India. *Internationale Revue Ges Hydrobiol.*, **70**(2) : 259-267.

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Raghunathan, M.B. 2006. Cladocera (Crustacea). Zoological Survey of India. *Fauna of Biligiri Rangaswamy, Wildlife Sanctuary Conservation Area Series* (Under publication).

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Sharma, B.K. 1991. Cladocera. In Animal Resources of India. 205-223 (State of the Art-Zoological Survey of India).

Sharma, B.K. and Michael, R.G. 1987. Review of taxonomic studies on freshwater Cladocera from India with remarks on biogeography. *Hydrobiologia*, **145** : 29-33.

Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 63-72, 2013

CRUSTACEA: DECAPODA: CARIDEA
(Freshwater Shrimps)

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INTRODUCTION

Freshwater habitats are abundant and diverse in Karnataka state and support myriads of aquatic faunas and floras. Freshwater shrimps (Crustacea: Decapoda: Caridea) are unique and play a very critical role not only in maintaining aquatic food chain but also in supporting aquaculture industry. In view of these, the freshwater prawns have been intensively studied for their taxonomy and biology. The distribution and seasonal changes of freshwater shrimps in and around Bangalore, Karnataka were recorded by Anantharaman *et al.* (1986). Jalihal *et al.* (1984 & 1988) studied the availability of freshwater shrimps of Dharwar area of Karnataka and described seven new species. The occurrence of freshwater shrimps in Bannerghata National Park, Karnataka was explored by Raghunathan and Valarmathi (2007). These earlier works reveal the distribution of 20 species of freshwater shrimps accommodated under 2 genera and 2 families. The present study is based on the collections made from different parts of Karnataka and available in the National Zoological collections of Southern Regional Centre, Zoological Survey of India, Kolkata. In this work 13 species of freshwater shrimps belonging to 2 genera and 2 families were examined.

CHECKLIST OF FRESHWATER SHRIMPS

Order DECAPODA

Infraorder CARIDEA

Superfamily ATYOIDEA

Family ATYIDAE

Genus *Caridina* H. Milne Edwards

1. *Caridina gurneyi* Jalihal, Shenoy and Sankolli, 1984
2. *Caridina kempi* Jalihal, Shenoy and Sankolli, 1984
3. *Caridina kunnathurensis* Richard and Chandran, 1994
4. *Caridina panikkari* Jalihal, Shenoy and Sankolli, 1984
5. *Caridina shenoyi* Jalihal and Sankolli, 1984
6. *Caridina rajadhari* Bouvier, 1918

Superfamily PALAEMONOIDEA

Family PALAEMONIDAE

Subfamily PALAEMONINAE

7. *Macrobrachium banjarae* (Tiwari 1958)
8. *Macrobrachium canarae* (Tiwari, 1958)
9. *Macrobrachium hendersodayanum* (Tiwari, 1952)
10. *Macrobrachium idea* (Heller, 1862)
11. *Macrobrachium idella idella* (Hilgendorf, 1898)
12. *Macrobrachium kistnense* (Tiwari, 1952)
13. *Macrobrachium lamarrei lamarrei* (H. Milne Edwards., 1837)
14. *Macrobrachium malcolmsonii* (H. Milne Edwards, 1844)
15. *Macrobrachium peguense* (Tiwari, 1952)
16. *Macrobrachium rosenbergii* (De Man, 1879)

17. *Macrobrachium sankollii* Jalihal et Shenoy, 1988
18. *Macrobrachium scabriculum* (Heller, 1862)
19. *Macrobrachium tiwarii* Jalihal, Shenoy and Sankolli, 1988
20. *Macrobrachium unikarnatakae* Jalihal, Shenoy and Sankolli, 1988

SYSTEMATIC ACCOUNT

Key to the families

1. Chela in the first and second pereiopod with tufts of hair ..... ATYIDAE
2. Chela in the first and second pereiopod without tufts of hair ..... PALAEMONIDAE

Key to the *Caridina* species

1. Rostrum as long as or longer than antennal scale 2

   Rostrum always shorter than antennal scale 4

2. Uppermargin of the rostrum with distal edentate part 3

   Uppermargin of the rostrum without distal edentate part and spines are arranged continuously ..... .*C. rajadhari* Bouvier 1918

3. The distal edentate part of the rostrum generally not interrupted by any teeth (but there are exceptions) and always with a subapical teeth ..... *C. nilotica* (P. Roux)

   The distal edentate part of the rostrum is always interrupted by 1 to 6 teeth and the tip of the rostrum is without subapical teeth .... *C. kunnathurensis* Richard & Chandran.

4. Rostrum always longer than 3/4th of the third segment of the antennular peduncle and the berried females with less number of (80-170) large sized eggs .... *C. gurneyi* Jalihal, Shenoy and Sankolli.

   Rostrum extends from 1/4th of the second segment of the antennular peduncle to 3/4th of the third segment of the antennular peduncle and the berried females with more number of (230-690) smaller size eggs .... *C. shenoyi* Jalihal and Sankolli.

1. ***Caridina gurneyi*** Jalihal, Shenoy and Sankolli, 1984

1984. *Caridina gurneyi* Jalihal, Shenoy and Sankolli. *Rec. Zool. Surv. India. Occ.Paper No.* **69:** 1-40

1994. Caridina *gurneyi*: Richard and Chandran. *J. Bombay nat. Hist. Soc.,* **91**(2): 242-259

2006. *Caridina gurneyi*: Mariappan and Richard, *Rec.zool.Surv.India,Occ.Paper No.* **243**: 39.

2007. *Caridina gurneyi*: Mariappan and Richard, *Rec. zool. Surv. India, Occ Paper No.* **261**: 55.

2007. *Caridina gurneyi*: Raghunathan and Valarmathi, *Rec. zool. Surv. India,* **107**(2): 95

2007. *Caridina gurneyi*: Raghunathan and Valarmathi, *Zool. Surv. India, Fauna of Bannerghatta National Park, Conservation Area Series,* **33**: 26.

Material examined: 3M and 19F (18BF) from Hosahalli, Mysore Dt. 20-i-1999, Coll: M.B.R; 17M and 32 F (11BF) from Srirangapattinam, Hassan-Mandy Dt., 1-i-2000, Coll: M.B.R; 39M and 48F (15BF) from K.R.Pet, Hassan-Mandya Dt., 2-i-2000, Coll: M.B.R; 9M, 15F (3BF) from Road to Aathuhullipara, Mysore Dt., 25-ii-2000, Coll: G.T; 1F from Hassan to Kalkere Road, Hassan Dt., 02-iv-2001, Coll: G.T; 6M and 13 F(2BF) from Aldur, Chickmagalur Dt., 16-iv-2002, Coll: M.B.R; 4F(3BF) from Honagodu, Chickmagalur Dt. Alt: 700m, 18-vi-2002, Coll: M. B. R; 3M from Chikkajala (Bangalore Dt.), 17-xii-2001, Coll: M.B.R; 1F from Balakolecanal, Mysore Dt., 16-xii-2005, Coll: S. P4M, 6F (2bf) from Rayapatnam, Hassan Mandya, 22-12-2000, coll: M. B. R; 1M and 3F (1 BF) from Doddakannur, Hassan Mandya, 24-xii-2000, Coll: M. B. R.

Diagnostic characters: Rostrum short extending from the end of the II segment to end of III segment of the antennular peduncle. Rostral formula 1-26/6-12 (3-6). Carapace 1.4 to 2.03 times as long as rostrum with a distinct antennal spine. Carpus of the first pereiopod is deeply excavated distally and is 1.4 to 1.8 times as long as its breadth. Carpus of

second pereiopod without any excavation and is 4 to 5.53 times as long as its breadth. The dorsal surface of the telson is armed with five to six pairs of spines, the terminal pair flanking the posterolateral angles. The posterior margin of the telson is possess 6 spines of which the lateral spines are stout. Exopod of the uropod with 17-23 movable spines. The berried females carried 135 to 192 eggs measuring 0.5-0.6 x 0.8-0.9mm. Males possess a well developed appendix interna on the endopod of the first pleopod.

Distribution: Karnataka, Kerala and Tamilnadu.

2. ***Caridina kunnathurensis*** Richard and Chandran, 1994

1994. *Caridina kunnathurensis* Richard and Chandran. *J. Bombay nat. Hist. Soc.*, **91**(2): 242- 259.

2006. *Caridina kunnathurensis*: Mariappan and Richard, *Rec.zool.Surv.India,Occ.Paper No.* **243**: 31.

2007. *Caridina kunnathurensis*: Mariappan and Richard, *Rec. zool. Surv. India, Occ. Paper No.* **261**: 46.

2007. *Caridina kunnathurensis*: Raghunathan and Valarmathi, *Rec. Zool. Surv. India* **107**(2): 95.

2007. *Caridina kunnathurensis*: Raghunathan and Valarmathi, *Zool. Surv. India, Fauna of Bannerghatta National Park, Conservation Area Series,* **33**: 26.

Material Examined: 6BF, 1M from Hosahalli, Mysore Dt., 20-i-1999, Coll: M. B. R; 9M; 30F(11BF) Srirangapatnam, Hassan-Mandya Dt., 1-i-2000, Coll: M. B. R; 21M and 48F (11BF) from K.R. Pet, Hassan-Mandya Dt., 2-i-2000, Coll: M.B.R; 23F(9bf) from Kabini River and around 600mts, Mysore Dt., 22-ii-2000, coll: G. T; 1M, 11F (5BF) from Road to Aathuhullipara, Mysore Dt., 25-ii-2000, Coll: G.T; 2M, 2F from Kollegal road, Mysore Dt., Alt: 600m, 28-ii-2000, Coll: G. T; 12F(5BF) from Rayapatnam, Hassan-Mandya dt., 22-xii-2000, coll: M. B. R; 3F(berried), 1M from Doddakannur, Hassan-Mandya Dt., 24-xii-2000, coll: M. B. R; 2F from Bhavanahalli, Hassan - Mandya Dt., 25-xii-2000, Coll: M. B. R; 4M and 4F from Muttigere, Hassan-Mandya Dt., 31-xii-2000, Coll: M.B.R; 5F(4BF) from Hassan to CR Patna, Hassan dt, 3-iv-2001, coll: G. T; 1F from Bengal Melkote WLS, 640 mts, Mandya dt, 10-iv-2001, Coll: G. T; 89M and 1F from Bengal Melkote WLS, 640 mts, Mandya dt, 10-iv-2001, Coll: G. T; 160F(139bf) from Chickkajala (Bangalore dt.) 800mts, Kolar-Bangalore dt., 17-xii-2001, coll: M. B. R; 165M, 148F and 249 juveniles from Doddanakere, BNP, 17.iii.2004, Coll: K.R.D; 1F from Palahalli, Mysore Dt., 14-xi-2005, Coll: S. P; 98M (few small No AI); 215 F(3BF) from Thimmanahalli, Hassan dt, 27-xii-2005, Coll: S. P; 3M and 2F from Hassan Dt., 28-xii-2005, Coll: S.P; 11F(7B), 3M from Kallakolla Range, Magaraja Kattle, 10-xii-2007, Coll: R. A;

Diagnostic characters: Rostrum straight or slightly upturned distally, equal to or slightly longer than the antennal scale. Rostral formula 11-34+1-6 / 6-16 (2 -5). In the dorsal margin of the rostrum 11-34 teeth are closely arranged on the proximal 1/2 to $3/4^{th}$ and the remaining edendate part is interrupted by 1-6 intermediate teeth normally there where no subdistal teeth. In the ventral margin the teeth are confined to the proximal ½ to ¾ and the remaining distal $1/4^{th}$ to half of the portion is completely free from rostral teeth. Carapace 0.78 to 1.05 times as long as rostrum with a distinct antennal spine. In first pereiopod carpus is slightly excavated distally and is 2 to 3.1 times as long as broad. In second pereiopod carpus is 4.0 to 5.2 times as long as broad and is without any excavation distally. The dorsal surface of the telson is armed with five pairs of spines, the terminal pair flanking the posterolateral angles. The postrior margin of the telson is moderately convex and possess 9 spines of which the lateral spines are stout. Exopod of the uropod with 8-13 movable spines. The berried females carried 25 to 92 eggs measuring 0.4-0.7 x 0.75-1.0 mm. Mostly adult males possess a well developed appendix interna on the endopod of the first pleopod.

Distribution: Andhra Pradesh, Karnataka and Tamilnadu.

3. ***Caridina nilotica*** (P. Roux, 1833)

1833. *Pelias niloticus* P. Roux, *Ann. Sci. Nat. Paris*, **28**(1) : 73. pl. 7. fig. 1.

1928. *Caridina nilotica* : Calman, *Proc. zool. Soc. London.* **XLIX**: 738

1950. *Caridina nilotica*: Barnard, *Annals of the South African Museum*. 657.

1980. *Caridina nilotica*: complex. Holthuis, *FAO Fish. Synop.*, **125**(1): 74.

2005. *Caridina nilotica*: Richard and Clark, *Proc. Biol. Soc. Washington*, **118**(4): 707.

2007. *Caridina gracilipes*: Raghunathan and Valarmathi, *Rec. zool. Surv. India,* **107**(2): 95

Material Examined: 2 F from Kothahalli, Bangalore Dt., 17-iii-2002, Coll: S.K;

Diagnostic characters: Rostrum slender mostly overreaching the tip of the antennalscale or equal to it. Rostral formula 12-26 +1-4/11-22 (0-3). In the dorsal margin of the rostrum the proximal group of 12-26 teeth are separated from the 1-4 (generally 1) subapical teeth by a wide distal gap, usually this gap is not interrupted by any intermediate teeth but occasionally it may be interrupted by 1-2 intermediate teeth. In the ventral margin of the rostrum teeth are arranged compactly throughout its entire length leaving a very small portion near the tip. Carapace 0.55 to 0.9 times as long as rostrum with a distinct antennal spine. In first pereiopod carpus is slightly excavated distally and is 1.6 to 2.7 times as long as broad. In second pereiopod carpus is 4 to 7 times as long as broad. The dorsal surface of the telson is armed with 4 to six pairs of spines, the terminal pair flanking the posterolateral angles. The posterior margin of the telson possess 3-4 pairs of spines of which the lateral spines are stout. Exopod of the uropod with 9-14 movable spines. The berried females carried 168 to 2000 eggs measuring 0.25-0.5x0.5-0.6mm. In first pleopod of males the endopod is with a well developed or poorly appendix interna or it may be totally absent or represented a by a bud, in the second pleopod appendix masculina is 0.65 to 0.67 times as long as endopod and 1.5 to 1.63 times as long as appendix interna.

Distribution: Commonly available in rivers, lakes, backwaters and small waterbodies in southern India.

4. ***Caridina rajadhari*** Bouvier 1918

1918. *Caridina rajadhari* Bouvier. *Bull. Mus. Nat. Hist. Paris.*, **24:** 386-393.

1975. *Caridina brachydactyla peninsularis*: Dutt and Ravindranath, *Current Science*, **44**(8): 269.

2007. *Caridina williamsonii*: Raghunathan and Valarmathi, *Rec. zool. Surv. India,* **107**(2): 96.

2007. *Caridina williamsonii*: Raghunathan and Valarmathi, *Zool. Surv. India*, Fauna of Bannerghatta National Park, Conservation Area Series, **33**: 27.

Material examined: 11M and 22F (14bf) from Srirangapatnam, Hassan-Mandya dt, 1-i-2000, Coll: M. B. R; 18F (8BF) from Muttigere, Hassan-Mandya Dt., 31-xii-2000, Coll : M.B.R ; 1BF from Hassan to Kalkere Road, Hassan Dt., Alt : 840mts, 02-iv-2001, Coll : G.T ; 2 BF from Hassan to CR Patna, Hassan dt, 3-iv-2001, Coll: G. T; 6M and 6F from Road to Mandya, Mandya Dt, Alt : 560mts, 4-iv-2001, Coll: G. T; 6F from Bengal Melkote WLS, 640 mts, Mandya dt, 10-iv-2001, Coll: G. T; 67M and 137F(9BF) from Nellore Shringeri-Agursh Road, Chickmagalore dt., 1-vi-2002, Coll: M. B. R; 4BF from Honagodu, 700mts, Chickmagalore dt., 18-vi-2002, Coll: M. B. R; 12F(6BF); 67M and 137F (9BF) from Sringeri, Chickmagalore Dt., 19-vi-2002, M. B. R; 1M, Bhadra River, Alt : 600mts, Chickmagalore dt., 24-vi-2002, Coll: M. B. R; 2M from Moorleygundi, BNP, 15-iii-2003, Coll: S. K; 5M and 1F from Chickrahally, BNP, 16-iii-2003, Coll: S. K; 475M, 679F and 225 juveniles from Doddanakere, BNP, 17-iii-2004, Coll: K. R.D; 42M and 48F from Gollahalliseleo, BNP, 20-iii-2004, Coll: K.R.D; 7M, 13F (3BF) from Thimmanahalli, Hassan dt , 27-xii-2005, Coll: S. P; 4F from Hassan Dt., 28-xii-2005, Coll : S. P ; 1 F from Kallakolla Range, Magaraja Kattle, 10-xii-2007, R. A; 19F(10BF), 5M from Thirthahalli Range, Kanagadurga tank, 19-xii-2007, Coll: R.A; 5M, 1F Megrahalli Range, Minehole(Nalur), Shimoga Dt, 20-xii-2007, R. A;

Diagnostic characters: Rostrum straight, equal to or slightly longer or shorter than the antennal scale. Rostral formula 27-47 / 5-14 (2-5). In the dorsal margin, the teeth are arranged throughout the length of the rostrum without any gap. In the ventral margin the teeth are arranged leaving a gap in ¼ of the distal end. In first pereiopod carpus is slightly excavated distally and is 1.75 to 2.23 times as long as broad. In second pereiopod carpus is 3.83 to 4.5 times as long as broad. The dorsal surface of the

telson is armed with 5 to 6 pairs of spines, the terminal pair flanking the posterolateral angles. The posterior margin of the telson is possesses 5 to 7spines of which the lateral spines are stout. Exopod of the uropod is with 9 to 15 movable spines. The berried females carried 57 to 250 eggs measuring 0.3-0.5x0.5-0.61mm. First pleopod of male with a well developed appendix interna on the endopod.

Distribution: Andhra Pradesh, Kerala, Karnataka, Maharashtra and Tamilnadu.

5. ***Caridina shenoyi*** Jalihal and Sankolli, 1984

1984. *Caridina shenoyi* Jalihal and Sankolli, *Rec. Zool. Surv. India. Occ.Paper No.* **69:**1-40

Material Examined: 13M and 80F (54BF) from Muttigere, Hassan-Mandya Dt., 31-xii-2000, Coll: M.B.R; 1BF from Hassan to CR Patna Road, Hassan Dt., Alt: 750-800mts, Coll: G.T; 3 F (1 BF), from Kollegal Road, Mysore Dt. 600m Alt, 28/ii/2000, Coll: M.B.R.

Diagnostic characters: Rostrum short extending from the half of the II segment of the antennular peduncle to ½ of III segment of the antennular peduncle. Rostral formula 21-22/4-6 (5-7) Carapace 1.75 to 2.08 times as long as rostrum with a distinct antennal spine. In first pereiopod carpus is deeply excavated distally and is 1.23 to 1.64 as long as broad. In second pereiopod carpus is 4.29 to 5.0 times as long as broad. The dorsal surface of the telson is armed with five to six pairs of spines, the terminal pair flanking the posterolateral angles. The posterior margin of the telson possess 4 pairs spines of which the lateral spines are stout and the median pairs are short and slim. Exopod of the uropod with 16-18 movable spines. The berried females carried 168 to 630 eggs measuring 0.3-0.35 x 0.5-0.6 mm. Males possess a well developed appendix interna on the endopod of the first pleopod.

Distribution: India: River Malapraba near Khanapur, Belgaum, Karnataka; Kerala, Boating Lake, Yercaud, Salem, Tamilnadu.

Key to the *Macrobrachium* species

1. Carpus distinctly longer than merus and second pereiopod of males normal and similar in both sexes 2

— Carpus subequal to or shorter than merus second pereiopod of males stronger and exhibits sexual dimorphism ..... *M. lanatum* Cai and Ng

2. Rostrum as long as or slightly longer than antennal scale with a distal edendate part followed by 1 or 2 subapical teeth 3

— Rostrum subequal to or slightly shorter than the antennalscale the rostral teeth is arranged throughout the entire length of the rostrum 4

3. Appendix masculina of the male second pleopod is as long as or slightly longer the endopd .... *M. lamarrei* (H. M. Edwards)

— Appendix masculina of the second pereiopod is about ½ of the endopod .... *M. canarae* (Tiwari)

4. Exopod of the uropod with subapical spine 5

— Exopod of the uropod without subapical spine 6

5. Chela of the second pereiopod shorter than or as long as 3/4th of the carpus .... *M. sankollii* Jalihal and Shenoy.

— Chela of the second pereiopod always longer than 3/4th of the carpus .... *M. unikarnatakae* Jalihal Shenoy and Sankolli.

6. Chela of the second pereiopod is always subequal to the carpus irrespective of size and sex .... *M. peguense* (Tiwari)

— Chela of the second pereiopod is generally shorter than carpus but in larger adult females it is equal to or longer than the carups 7

7. Rostrum equal to to or slightly longer/shorter than the antennal scale .... *M. tiwarii* Jalihal Shenoy and Sankolli

— Rostrum always shorter than the antennalscale ..... *M. kistnense* (Tiwari)

6. ***Macrobrachium canarae*** (Tiwari, 1958)

1958. *Palaemon canarae* Tiwari, *Rec. Indian Mus.*, **53**: 298

1988. *Macrobrachium canarae:* Jalihal, Shenoy and Sankolli, *Rec. zool. Surv. India, Occ. Paper No.* **112**: 8.

1991. *Macrobrachium canarae*: Jayachandran, *Mahasagar,* **24** (2): 139.

2001. *Macrobrachium canarae:* Jayachandran Palaemonid Prawns Biodiversity, Taxonomy,

Biology and Management. *Oxford & IBH Publishing Co. Pvt. Ltd. Calcutta*.pp. 84.

2006. *Macrobrachium canarae*: Mariappan & Richard, *Rec. zool. Surv. India, Occ. Paper No.* **243**: 62.

Material Examined: 67 M and 27F (8BF) from Anejan (Mavinkar), Dakshin Kannada Dt., 13-iv-1999, Coll: G.T;

Diagnostic characters: Rostrum mostly longer than antennular peduncle and antennalscale, occationally it is equal to the antennalscale. When the length of the rostrum extends much beyond the antennalscale it appears slightly upturned otherwise it is straight. Dorsal margin of the rotrum with 4-9 proximal teeth which is widely separated from one or two subapical teeth. Most of the time the distal gap is interrupted by 2-3 intermediate teeth and 1-2 of the proximal teeth are located behind the orbit. The ventral margin of the rostrum with 4-7 teeth (in one specimen 10 teeth was observed). Lot of variation is observed in the number and and arrangement of the teeth on the rostrum. Carapace smooth with an antennal and hepatic spines and is about 0.64-1.15 times as long as rostrum. Second pereiopods are slender equal and similar in both sexes. It is about half of the total body length and overreaches the antennalscale by the chela. Fingers 0.79 to 1.0 times as long as palm; the movable finger with 2 two weak denticles in the proximal cutting edge and the fixed finger is with one denticle (the denticles are observed only in few large adults and most of the time fingers are smooth without denticles). In males chela is always less than $3/4^{th}$ of the carpus but in few females it is slightly longer than $3/4^{th}$ of the carpus. Carpus is longer than merus and about 10.4-15 times as long as its distal diameter. The exopod of the uropod without accessory spine. The berried females carried 44-127 eggs measuring 1.15-1.4X1.4-1.85mm.

Distribution: Karnataka, Kerala and Tamilnadu.

7. ***Macrobrachium kistnense*** (Tiwari, 1952)

1949. *Palaemon lanchesteri*: Tiwari, *Rec. Indian Mus.*, **45**: 340

1952 *Palaemon kistnensis* partim Tiwari, *Ann. Mag. nat. Hist.*, **5**: 28.

1988 *Macrobrachium kistnensis* : Jalihal, Shenoy and Sankolli, *Rec. zool. Surv. India, Occ. Paper No.* **112**: 34.

2001 *Macrobrachium kistnense* Jayachandran. Palaemonid Prawns Biodiversity, Taxonomy, Biology and Management. *Oxford & IBH Publishing Co. Pvt. Ltd. Calcutta*. p. 126.

2007. *Macrobrachium kistnensis* : Patil, Yadav and Jadhav, *Bionotes,* **93**(3): 85.

2007 *Macrobrachium kistnense*: Raghunathan and Valarmathi, *Zool. Surv. India, Fauna of Bannerghatta National Park, Coservation Area Series,* **33**: 28

Material Examined: 42M and 41F (11 berried) from Melkote Wildlife Sanctuary, 10-iv-2001, Coll: G. T; 3M and 4F from BNP, 15-iii-2003, Coll: S. K; 1M and 1F from BNP, Coll: K. R.D; 1M from BNP, 20-iii-2004, Coll: K. R.D; 4M and 2F from BNP, 22-iii-2004, Coll: K. R.D;

Diagnostic characters: Rostrum slightly longer than or equal to antennular peduncle but always falls short of the antennal scale. Upper margin of the rosrum with 5-9 teeth of which 1 or 2 are located behind the orbit and the lower margin carries 2-5 teeth. Carapace smooth and 0.95 to 1.49 times the length of the rostrum. Second pereiopods are simple and similar in both the sexes; Ischium is shorter than merus, carpus and chela but longer than finger and palm; Merus shorter than carpus (merus 0.7 to 0.75 times the length of the carpus); Chela shorter than carpus (chela 0.78 to 0.95 times the length of the carpus) the length of the chela overreaches the carpus in larger females (Table); Fingers shorter than palm (fingers 0.6 to 0.81 times of the length of the palm). In the second pleopod appendix masculina is 0.79 times as long as endopod and 1.53 times as long as appendix interna. Exopod of the uropod lacks accessory sub apical spine. The berried females carried 48-109 eggs and the size of the egg ranges from 1.3-1.5 x 1.0-1.3.

Distribution: Maharashtra, Karnataka.

8. ***Macrobrachium lamarrei***
(H. Milne Edwards., 1837)

1837. *Palaemon lamarrei* H. Milne Edwards., *Hist. Nat. Crustaces*, **II**: 397.

1908. *Palaemon (Eupalaemon) lamarrei*: De Man *Rec. Indian. Mus.* **2**: 222.

1910. *Palaemon lamarrei*: Henderson and Matthai, *Rec Indian Mus*, **5**: 301.

1950. *Macrobrachium lamarrei* : Holthuis, *Siboga Exped. Monogr.*, **39 a** (9) : 119.

1988. *Macrobrachium lamarrei lamarrei* : Jalihal, Shenoy and Sankolli, *Rec. Zool. Surv. India, Occ. Paper No.* **112**: 2

2002. *Macrobrachium lamarrei*: Cai and Ng, *Hydrobiologia*, **487**: 76.

2007. *Macrobrachium lamarrei*: Raghunathan and Valarmathi, *Zool. Surv. India, Fauna of Bannerghatta National Park, Coservation Area Series*, **33**: 28.

Materials examined: 9F(4BF) from, Thumbalahalli Dam, 23-xi-1996, Coll: M.B.R; 17M and 49F(1bf), from Kabini River and around 600mts, Mysore Dt., 22-ii-2000, Coll : G. T; 9M and 5F from Kollegal Road, Mysore dt., 28-ii-2000, Coll: G.T; 3M and 5F from Kolpaj, Hassan Mandya dt., 28-xii-2000, Coll: M.B.R; 56F(4BF), 15M from Kothahalli (near Bangalore) Bangalore Dt., 17-iii-2002, Coll: S. K; 56M and 112F from Doddanakere, BNP, 17-iii-2004, Coll: K.R.D; 11M and 33F from Muninagaram, BNP, 22-iii-2004, Coll: K.R.D; 8M and 22F from Seenappanthotti (Attolipura), Chamrajnagar, 20-xii-2005, Coll: S. P;

Diagnostic characters: Rostrum longer than antennular peduncle and longer than or equal to the antennal scale. Rostral formula 4-7+1-2 / 4-9 (1-2). In the upper margin of the rostrum a proximal group of 4-7 teeth are widely separated from the distal 0-2 sub-terminal tooth. Rostrum exhibits considerable variation in length, number and arrangement of teeth. Carapace smooth with antennal and hepatic spine and is about 0.75 to 1.0 times as long as the rostrum. The second pereiopods are simple and similar in both the sexes. In this the finger is shorter than the palm (Finger/Palm=0.63-1.0); chela nearly ½ of the carpus (Chela/Carpus= 0.55-0.57 in males and 0.55-0.67 in females); merus longer than chela but shorter than carpus; ischium slightly longer than chela and more less equal to the merus. The appendix masculina of this species is peculiar and differs from other species by it longer appendix masculina which is subequal to or longer than the endopod. Exopod of the uropod lacks accessory sub apical spine. The berried females carried 38 to 289 eggs ranging from 0.85-1.2x1.0-1.6 mm.

Distribution: This species occurs in Fresh and Brackish water sometimes it is subterranean (Holthius, 1950). It is commonly available in Rivers, lakes and tanks in India.

9. ***Macrobrachium lanatum*** Cai and Ng

1910. *Palaemon dolichodactylus* Henderson and Matthai, *Rec. Indian Mus.*, **4**(4):300 pl. 18 figs 8 a b.

1950. *Palaemon (Parapalaemon) dolichodactylus* Barnard, *Annals of the South African Museum.*779.

1988. *Macrobrachium scabriculum*: Jalihal, Shenoy and Sankolli, *Rec. Zool. Surv. India, Occ. Paper No.* **112**: p. 42 figs 12, 13.

1999 *Macrobrachium dolichodactylus*: Yeo, Cai and Ng. *Raffles. Bull. Zool. Suppl.* **6** : 235, figs 20a-f.

2001 *Macrobrachium scabriculum*: Jayachandran Palaemonid Prawns Biodiversity,

Taxonomy, Biology and Management. *Oxford & IBH Publishing Co. Pvt. Ltd. Calcutta.* 164.

2002. *Macrobrachium lanatum*: Cai and Ng. *Hydrobiologia*, **487**: 72, fig, 13-16.

Material Examined: 2M and 1 F from Anejan (Mavinkar), Dakshinkannada Dt., 13-iv-1999, Coll: G. T.

Diagnostic Characters: Rostrum straight always shorter than antennalscale either it is equal to or slightly longer than the end of the antennular peduncle. Rostral formula 12-14/2-3 (3-5). Carapace smooth with antennal and hepatic spines and is about 1.1 to 1.9 times as long as rostrum. The second pereiopods are stronger and unequal in adult males exhibiting sexual dimorphism. Either the right or left leg is larger than the other both the pereiopds are entirely tuberculated. The major second pereiopod of the male overreaches the antennalscale by its entire carpus; and is subeaqual

to the total length of the body; entire cheliped except ½ of the finger is covered with long thin velvety hair; the palm and proximal ½ of the finger is thickly pubescent; fingers are slender, twice as long as palm and armed with 22-35 denticles; carpus is slightly longer than merus. Entire second minor pereiopod is covered by sparsely arranged thin long velvety hairs and is covered with closely arranged minute turebcles. It exceeds the antennalscale with its 1/4th of the carpus. The fingers are armed with 3-5 denticles. Finger is 1.6 times as long as palm; carpus is subequal to merus. Propodus 2.5 times as long as dactylus, merus shorter than propodus and nearly twice as long as carpus. Exopod of the uropod with an accessory subapical spine.

Distribution: Kerala, Karnataka.

10. ***Macrobrachium peguense*** (Tiwari, 1952)

1952. *Palaemon peguense* Tiwari, *Ann. Mag. Nat. Hist.,* **V** (ser. 12): 27.

2001. *Macrobrachium peguense*: Jayachandran, Palaemonid Prawns Biodiversity, Taxonomy, Biology and Management. *Oxford & IBH Publishing Co. Pvt. Ltd. Calcutta.* 157.

2005. *Macrobrachium peguense*: Raghunathan & Valarmathi. *Rec. zool.Surv. India,* **105**(part3-4):51-56.

2007. *Macrobrachium peguense*: Raghunathan and Valarmathi, *Rec. zool. Surv. India,* **107**(2): 98.

Materials examined: 21M and 44F(14BF) from Budipadaka, BRTWLS, 18-ii-1999, Coll: S.K; 5M and 11F from Bhanuwadi, BRTWLS,19-ii-1999, Coll: S.K; 16M and 8F from Harangiri Dansite, BRTWLS, 9-iv-1999, Coll: G.T; 2M and 1BF from Seebinaekare, BRTWLS, 7-iv-2000, Coll: S.K; 1F from Mandya Dt., 4-iv-2001, Coll: G.T; 23M and 25F from Balakolecanal, Mysore Dt., 16-xii-2005, Coll: S.P; 13M and 10F from Hassan Dt., 28-xii-2005, Coll: S.P; 8M and 6F from Hassan Dt., 28-xii-2005, Coll: S.P;

Diagnostic characters: Rostrum always longer than the antennular peduncle and slightly shorter than or rarely equal to the antennal scale. Rostral formula 6 - 10/3 - 5 usually with 7 - 9 / 3 - 4, with one or two post orbital teeth. In the lower margin of the rostrum, teeth are equidistant but in the upper margin though the teeth are equidistant slight variations in distance were also observed. The upper margin is with or without sub apical teeth if present also it is not widely separated from the remaining teeth. The second cheliped is equal on both the sides and similar in both the sexes. It is sub equal to the half of the total body length. It over reaches the antennal scale by the entire chela and 1/5th of the carpus. In males the length of the cheliped is 1 or 2mm shorter than the half of the total body length, but in females it is 0.3 to 3.6mm longer than the half of the total body length. Carpus is distinctly longer than the merus. Chela is sub equal to the carpus. Mostly carpus is slightly longer (0.1 - 1.1mm) than the chela, occasionally it is equal to or slightly (0.1 - 1.1mm) shorter than the chela. Finger is always shorter than the palm (0.6 - 0.8mm) with delicate hairs at the tip. Cutting edges of both movable and immovable fingers of males are smooth without any tubercles. The number of eggs varies from 67 - 122 and size of the eggs ranges from 1.2 - 1.8 x 0.9 - 1.5mm.

Distribution: Karnataka, Kerala, Tamilnadu.

11. ***Macrobrachium sankollii*** Jalihal and Shenoy, 1988

1988. *Macrobrachium sankollii* Jalihal and Shenoy, *In: Rec. Zool. Surv. India, Occ. Paper* **112**: 11.

2001 *Macrobrachium sankollii*: Jayachandran. Palaemonid Prawns Biodiversity, Taxonomy, Biology

and Management. *Oxford & IBH Publishing Co. Pvt. Ltd. Calcutta.* p.162.

2007. *Macrobrachium sankollii*: Raghunathan and Valarmathi, *Zool. Surv. India, Fauna of Bannerghatta National Park, Coservation Area Series,* **33**: 29

Materials examined: 4M, 5F (1BF) from Karad, Kodagu-Dakshinkannad Dt., 13-ix-1998, Coll: M.B.R; 5F from Chikbanavare, Hassan-Mandya Dt., 19-xii-2000, Coll: M.B.R; 4M, 4F from Hassan to Kalkere Road, Hassan Dt., Alt: 840mts, 02-iv-2001, G.T; 25M, 31F(6BF) from Hassan to CR Patna Road, Hassan Dt., Alt: 800mts, 03-iv-2001, Coll: G.T; 1M from Chikkajala, Bangalore Dt., Alt: 800mts, 17-xii-2001, Coll: M.B.R; 1M from

Honagodu, Chickmagalur Dt., Alt: 700mts, 18-vi-2002, Coll: M.B.R; 136M and 114F from Village pond, 27-vi-2002, Coll: M.B.R; 1M and 1F from Gaddhealla, BNP, 15-iii-2003, Coll: S.K; 3F from Jodhithimmapura, Chikmagalur Dt., 22-iii-2003, Coll: S.K; 1M and 2F from Bhadra River, Chickmagalur Dt., Alt: 600mts, 24-vi-2003, Coll: M.B.R; 3M and 11F from Mulegundi, BNP, 18-iii-2004, Coll: K. R. D; 8M and 18F from Udigabande, BNP, 18-iii-2004, Coll: K. R. D; 3M and 2F from Uchanakante, BNP, 18-iii-2004, Coll: K. R. D; 2M and 10F from Chettahalli, Medikere Dt., 24-xii-2005, Coll: S.P; 7M and 10F (7BF) from Thimmanahalli, Hassan Dt., 27-xii-2005, Coll: S.P;

Diagnostic characters: Rostrum always longer than the antennular peduncle and slightly shorter than or equal to or slightly longer than antennular peduncle and exhibits lot of variation. Rostral formula 4-8 / 2-4 (1-2). Carapace smooth and 0.87 to 1.25 times as long as rostrum. The second pereiopods are simple and similar in both the sexes. In this finger is 0.59 to 0.89 times as longs palm; chela slightly shorter than, equal to or slightly longer than ¾th of the carpus; carpus longer than merus and 9.4 to 12.86 times as long as its width; merus longer than the ischium and subequal to the chela. In males second pleopod appendix masculina is 0.67 to 0.68 times as long as endopod and 2.13 to 2.75 times as long as appendix interna. The berried females carried 35 to 175 eggs ranging from 1.0-1.3 x 1.0-1.8mm. Exopod of the uropod with an accessory sub apical spine.

Distribution: Karnataka, Kerala.

12. ***Macrobrachium tiwarii*** Jalihal, Shenoy and Sankolli, 1988

1988 *Macrobrachium tiwarii* : Jalihal, Shenoy and Sankolli , *Rec. Zool. Surv. India, Occ. Paper No.* **112**: 27.

2001. *Macrobrachium tiwarii*: Jayachandran. Palaemonid Prawns Biodiversity, Taxonomy, Biology and Management. *Oxford & IBH Publishing Co. Pvt. Ltd. Calcutta*. p.171.

2007. *Macrobrachium tiwarii*: Raghunathan and Valarmathi, *Zool. Surv. India, Fauna of Bannerghatta National Park, Coservation Area Series,* **33**: 30.

Materials examined: 3M and 1F from Hosahalli, Mysore Dt., 20-i-1999, Coll: M.B.R; 24M and 23F from K.R. Pet, Hassan-Mandya Dt., 2-i-2000, Coll: M.B.R; 2??and 3?? from Udigabande, BNP, 18-iii-2004, Coll: K.R.D;

Diagnostic characters: Rostrum always longer than antennular peduncle and slightly shorter than or equal to the antennal scale. Rostral formula 6-9 / 3-4 (1-2). Carapace 0.8 to 1.36 times of the rostrum. Though the second chelipeds of male and female look simple and similar shows slight variation in the length of various segments. Both in males and females fingers are slightly shorter than or equal to the palm, ishium is more or less equal to the merus. In males the carpus is longer than the chela (1.43 to 1.5 times) and the merus is much shorter than carpus but equal to propodus. In females carpus is more or less equal to chela and the merus is much shorter than carpus and propodus. Exopod of the uropod lacks accessory sub apical spine.

Distribution: Karnataka, Puducherry, Tamilnadu.

13. ***Macrobrachium unikarnatakae*** Jalihal, Shenoy and Sankolli, 1988

1988., *Macrobrachium unikarnatakae*: Jalihal, Shenoy and Sankolli, *Rec. Zool. Surv. India, Occ.Paper No.* **112:** 21

2001.,*Macrobrachium unikarnatakae*: Jayachandran, Palaemonid Prawns Biodiversity, Taxonomy, Biology and Management. *Oxford & IBH Publishing Co. Pvt. Ltd. Calcutta*. p.174.

2007., *Macrobrachium unikarnatakae*: Raghunathan and Valarmathi, *Rec. zool. Surv. India,* **107**(2): 100.

2007. *Macrobrachium unikarnatakae*: Raghunathan and Valarmathi, *Zool. Surv. India, Fauna of Bannerghatta National Park, Coservation Area Series,* **33**: 30.

Materials examined: 4F from Mulegundi, 15-iii-2003, Coll: S.K; 1M from Mulegundi, BNP, 18-iii-2004, Coll: K. R.D; 6F from PoojakalMullah Nagerhole Range, 2-xii-2007, Coll: R.A;

Diagnostic characters: Rostrum shows considerable variation with or without slightly raised basal crest and is always longer than the antennular peduncle but slightly shorter than or equal to or slightly longer than than the antennalscale. Carapace

smooth with antennal and hepatic spine. In younger animals carapace is shorter than rostrum but in adults it is subequal to the rostrum. The second pereiopods are similar in both the sexes without exhibiting sexual dimorphism. In second pereiopods finger is shorter than palm (0.76-0.79 times as long as palm); chela is always longer than the $3/4^{th}$ of the carpus (0.76-0.92 times as long as carpus); merus is slightly longer than the ischium and subequal to the chela; movable figers in some cases armed with two weak denticles and the fixed finger is either smooth or with one denticle; in most of the cases both the fingers are smooth. Exopod of the uropod with accessory sub apical spine. In male second pleopod appendix masculina is 0.75 to 0.83 times as long as endopod and 1.58 to 1.93 times as long as appendix interna. A berried female carried 124 eggs of the size ranging from 1.2-1.3x1.4mm.

Distribution: India: Karnataka, Kerala, Tamilnadu.

SUMMARY

In this study, 13 species of freshwater shrimps belonging to 2 genera and 2 families were recorded and their diagnoses were provided from the collection made from various parts of Karnataka by the Southern Regional Centre, Zoological Survey of India, Chennai.

Abbreviations used: M- Male; F- Female; BF- Berried Female; G. T- G. Thirumalai; M. B. R - M. B. Raghunathan; K. R- K. Rema Devi; O.P.S- O.P.Srivastava; S.K- S. Krishnan; R.A - R. Aengals; S.P- S. Prabakaran.

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CRUSTACEA : DECAPODA : GECARCINUCIDAE (FRESHWATER AND LAND CRABS)

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INTRODUCTION

The fresh water and land crabs of Karnataka state was studied based on the material collected during the extensive surveys of southern Karnataka undertaken by the various survey parties of Southern Regional Center, Zoological survey of India, Chennai (T.N.). The specimens belonging to Northern K'nataka, lying unidentified at Western Regional Center, Zoological Survey of India, Pune (Maharashtra) were also included to enumerate the species composition of K'nataka state.

First record of the Gecarcinucid crabs from Karnataka was described by Rathbun (1904-1906). Subsequently few Carcinologist viz.Alcock (1910), Chopra (1947), Dutta (1983) and Srivastava (2006) and (2007) recorded scanty information on the freshwater crabs of Karnataka state. Bott (1970), in his comprehensive revisionary work on this group, accounted 8 species under 6 genera of two families from Karnataka based on the characters of pleopods in addition to traditional characters set by Alcock (1910). The author followed the classification of Bott (1970).

The present study reveals 10 species, accommodated under 6 genera and two families based on the collection as stated above.

SYSTEMATIC LIST

Order DECAPODA

Infraorder BRACHYURA

Family GECARCINUCIDAE

1. *Barytelphusa (Barytelphusa) cunicularis* (Westwood 1836).
2. *Barytelphusa (Barytelphusa)* guerini (Milne-Edwards 1853).
3. *Gecarcinucus jacquemontii* Milne-Edwards 1844
4. *Gubernatoriana gubernatoris* (Alcock 1909).
5. *G. pilosipes* (Alcock 1909)
6. *Travancoriana pollicaris* (Alcock 1909).
7. *Travancoriana schirnerae* Bott 1969.

Family PARATHELPHUSIDAE

8. *Spiralothelphusa hydrodroma* (Herbst 1794).
9. *Oziotelphusa senex senex* (Fabricius1798).
10. *Oziotelphusa wagrakarowensis* (Rathbun 1904).

1. ***Barytelphusa (Barytelphusa) cunicularis*** (Westwood 1836)

1836. *Thelphusa cunicularis* Westwood, in Sykes & Westwood, *Trans.Entom.Soc.* London, **1** : 183, T.19.

1871. *Thelphusa indica* Westwood, *J. Asiat. Soc. Bengal,* **40**(2) : 196.

1905. *Potamon (Potamonautes) jacquemontii* Rathbun, *Nouv. Arch. Mus.* (4)**7** : 185, T.16 F.1, 5.

1910. *Paratelphusa (Barytelphusa) jacquemontii* Alcock, *Cat. Ind. Decap. Crust. Ind. Mus,* **1**(2) : 79, T.12, F. 55.

1970. *Barytelphusa (Barytelphusa) cunicularis* Bott, *Abh. Senckenb. Nature, Ges.* No. **526** : 30

2006. *Barytelphusa (Barytelphusa) cunicularis* Bott: Srivastava & Krishnan, *Zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27** : 17-20.

Material examined : 7 exs., Western Ghat Survey, Karwar Mysore, 23.ii.1971, B.S. Lamba; 8 exs.,Western Ghat Surevy, Karwar Mysore, 26.ii.1971, B.S. Lamba; 2exs., Menchali, Kolar, Karnataka, 20.iii.1978, M.B. Rao; 1ex., Sharavati Jogfall, North Kanara river, Karnataka 26.ix.1991, R.M Sharma. 3 exs., Paisani river, South Kanara, Karnataka, 10.ii.1992, P.P. Kulkarni; 14 exs., Shivaete R.F., D. Kanada, karnataka, 10.xii.1998; M.S. Ravichandran; 2 exs., Kolar road, BRT. WLS, Karnataka, 2.ii.1999, G.Thirumalai; 5 exs., Honametti Bedaguli, BRTWLS, Karnataka, 20.ii.1999, S. Krishnan; 3 exs., Basavangodu, BRT. WLS, Karnataka, 20.ii.1999, S. Krishnan; 14 exs., K. Gudi, Karnataka, 21.ii.1999, S. Krishnan ; 25 exs., K. Gudi, BRTWLS, Karnataka, 24.ii.1999, S. Krishnan; 7 exs., Hanakere, BRTWLS, Karnataka, 25.ii.1999, S. Krishnan; 4 exs., Basavangodu, 28.ii.1999, S. Krishnan; 1.iii.1999, S. Krishnan ; 4 exs., Basavangodu, Karnataka, 3.iv.1999, G. Thirumalai ; 4 exs., Hosahalli, Mysore, Karnataka, 20.xi.1999, M.B. Raghunathan ; 14 exs., BRT Hills, Karnataka, 22.xi.1999, M.B. Raghunathan ; 6 exs., Ranganathan Koil, Karnataka, 19.ii.2000, G. Thirumalai ; 7 exs., BRT Hills, Karnataka, 20.ii.2000, G. Thirumalai ; 2 exs., Dodasampige, Karnataka, 20.ii.2000, G. Thirumalai ; 2 exs., Doddasempige, BRTWLS, Karnataka, 2.iii.2000, G.Thirumalai; 8 exs., K. Gudi, BRTWLS, Karnataka, 7.iv.2000, S. Krishnan. 8 exs., K.Gudi, Karnataka, 7.iv.2000, Krishnan ; 4exs., Muthyala, B.N.P., Karnataka, 15.ix.2003, G. Thirumalai; 4 exs., Athikupae halli, B.N.P., Karnataka, 17.ix.2003, G. Thirumalai; 14 exs, Doddaannakar, B.N.P., Karnataka, 17.iii.2004, K. Rema Devi; 10 exs., Udigebande, Karnataka, 18.iii.2004, K. Rema Devi; 1ex. Madeshpura Koil Kere, B.N.P., Karnataka, 19.iii.2004, K. Rema Devi; 3exs., Gubamadugo, B.N.P., Karnataka, 20.iii.2004, K. Rema Devi.

Diagnosis : Carapace flat; its length three fourths its greatest breadth and depth is less than half its length.Anterolateral margin of carapace is well defined. Cervical groove very prominent and deep, broadly V-shaped, runs towards lateral epibranchial tooth. Epigastric and post orbital crests form a bold ridge from mesogastric region to the lateral epibranchial tooth. The exopodite of the external maxillipeds is much longer than ischium and carries the hairy flagellum. This species attains a large size to maximum 3 inches long and 4 inches broad.The chelipeds are unequal in the male but almost equal in female.

Distribution : India : West Bengal (Burger) Andhra Pradesh, Bihar (undivided), Karnataka, Kerala, Maharastra, Tamil Nadu, and Uttar Pradesh (undivided)

Elsewhere : Sri Lanka (Doflein).

2. ***Barytelphusa (Barytelphusa) guerini*** (H. Milne-Edwards 1853)

1853. *Thelphusa guerini* Milne-Edwards, *Ann. sci. nat.*, (3)**20** : 210.

1871. *Telphusa guerini* Westwood, *J. Asiat. Soc. Bengal*, **40**(2) : 190,203.

1905. *Potamon (Potamonautes) guerini* Rathbun, *Nouv. Arch. Mus.*, (4)**7** : 186, T.16, F.2.

1910. *Paratelphusa (Barytelphusa) guerini* Alcock, *Cat. Ind. decap. Crust. Ind. Mus,* **1**(2) : 87, T.12, F.57.

1970. *Barytelphusa (Barytelphusa) cunicularis* Bott, *Abh. Senckenb. Nature, Ges.* No. **526** : 33.

2006. *Barytelphusa (Barytelphusa) cunicularis* Bott: Srivastava & Krishnan, *Zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series*, **27** : 17-20.

2007. *Barytelphusa (Barytelphusa) cunicularis* Bott: Srivastava, *Zool. Surv. India, Fauna of Andhra Pradesh, State Fauna Series,* **5**(Part-4) : 245-248.

Material examined : 5exs.,Devimani ghat, Mysore, Karnataka, 11.ii.1971, B.S. Lamba; 3 exs., Kanheri river, Karwar Mysore, Karnataka, 05.xi.1971, B.S. Lamba; 2 exs., Picrup dam, Nilgiri Biosphere Reserve, Karnataka, 23.xii.1988, G.M. Yazdani; 2 exs., Kolar Road, Karnataka, 2. ii.1999, G. Thirumalai; 3 exs., Honametti Bedaguli, Karnataka, 20.ii.1999, S. Krishnan; 3 exs., Biligiri Rangasamy Temple Hills, Karnataka, 1.iii.1999, S. Krishnan; 2 exs., Basavanagodu, Karnataka, 3.iv.1999, G. Thirumalai; 2 exs., Biligiri Rangasamy Temple Hills, Karnataka, 20.ii.2000,

G. Thirumalai ; 3 exs., Doddannakar, B.N.P., Karnataka,17.iii.2003, K. Rema Devi; 4 exs., Ebetta,B.N.P.,Karnataka, 14.ix.2003, G. Thirumalai; 2exs., Athkupae halli, B.N.P., Karnataka, 17.ix.2003, G. Thirumalai; 4 exs., Gubamadugo, B.N.P., Karnataka, 20.iii.2004, K. Rema Devi; 2exs., Muninagaram, B.N.P., Karnataka, 22.iii.2004, K. Rema Devi.

Diagnosis : Carapace broad, deep and strongly convex; its lenrth in the adult male is about two-third its greatest breadth but is more than two-third in the adult female;its depth is half of its length. Antero-lateral border of carapace is strongly convex and well defined. Cervical groove broad and deep running towards but not reaching to lateral epibranchial tooth. The epigastric and postorbital crests form one prominent ridge, Continuous, on either side of mesogastric furrow.The chelipeds are much more unequal in the male than female.

Distribution: India : Andhra Pradesh,Assam, Karnataka, Madhya Pradesh, Maharashtra, Tamil Nadu.

Elsewhere : Not recorded.

Remarks : This is first record of occurrence from Karnataka State.

3. ***Gecarcinucus jacquemontii*** Milne-Edwards 1844

1844. *Gecrcinucus jacqumontii* Milne-edwards, in jacquemont,*Voy.I'India* 1832, 4 : 4,T.1

1853. *G. jacqumontii* Milne-Edwards, *Ann. Sci. nat.*, (3)**20** : 205, TII F.1.

1871. *G. jacqumontii* Wood-Mason, *J. asiat. Soc.* Bengal., **40**(2) : 190.

1906. *G. jacqumontii* Rathbun, *Nouv. Arch. Mus.*, (4)**8** : 67, T.19 F.1-2.Abb.122.

1909. *G. jacqumontii* Alcock, *Rec.ind.Mus.*, **3** : 380.

1909. *G. jacqumontii* Edwardsi : Alcock, *Rec. ind. Mus.*, **3** : 380.

1910. *G. (G.) jacqumontii* Alcock, *Cat. Ind. decap. Crust. Ind. Mus,* **1**(2) : 122, T.13, F.66.

1910. *G. (G) edwardsi* Alcock *Cat. Ind. decap. Crust. Ind. Mus,* **1**(2) : 124, T.9, F.35.

1970. *Gecrcinucus jacqumontii* Bott *Abh. Senckenb. Nature, Ges.* No. **526** : 30

Material Examined : Nil. The account stated from the literatures.

Diagnosis : Carapace convex, subcylindrical, cervical groove very broad and deep, long, narrow forming anteroposterior loop. Front square cut, its width little more than the maximum diameter of the orbit,and about one sixth the greater breadth of the carapace; finger-cleft and inner surface of palm nacked. Epigastric crests low, blunt, obscure continuous on either side of the mesogastric groove. Chelepeds are unequal in both sexes.

Distribution: India : Maharashtra, Karnataka.

Elsewhere : Not recorded

4. ***Gubernatoriana gubernatoris*** (Alcock 1909)

1910. *Paratelphusa (Globitelphusa) gubernatoris* Alcock, *Cat. Ind. Decap. Crust. Ind. Mus.*, **1**(2) : 117, fig. 32.

1970. *Gubernatoriana gubernatoris* Bott, *Abh. Senckenb Natur.* Ges. No. **526** : 44.

Material Examined : 1ex., Doddannakar, B.N.P., Karnataka, 7.iii.2004, Rema Devi.

Diagnosis : Carapace flat and squarish, its length nearly seven-eights its breadth and depth less than half its length. The antero-lateral borders of the carapace short and almost straight from the orbit. A long shallow cervical groove separate the just distinguishable epigastric crests .The exopodite of the third maxillipede is longer than ischium and is usually non-flagellate. The chelipeds are unequal in both the sexes.

Distribution : India : Kerala (Kochi), Maharashtra (Mahabaleshwar), Karnataka.

Remarks : This species is the first record of occurrence from Karnataka state.

5. ***Gubernatoriana pilosipes*** (Alcock 1909)

1909. *Paratelphusa (Globitelphusa) pilosipes* Alcock, *Rec. ind. Mus.*, **3** : 379.

1910. *Paratelphusa (Globitelphusa) pilosipes* Alcock, *Cat. Ind. decap. Crust. Ind. Mus,* **1**(2) : 118, T.9, F.33.

1970. *Gubernatoriana pilosipess* Bott, *Abh. Senckenb Natur.* Ges. No. 526 : 46.

Material Examined : Nil. The account stated from the literatures.

Diagnosis : The species is closely related to *Gubernatoriana gubernatoris* except the carapace is little broader and the cervical groove is even less distinct. The epigastric and post orbital crests are faint.

Distribution : India : Maharashtra, Karnataka.

Elsewhere : Not recorded.

6. ***Travancoriana pollicaris*** (Alcock 1909)

1909. *Paratelphusa (Barytelphusa) pollicaris* Alcock, *Rec. Indian Mus.,* **3** : 377

1970. *Travancoriana pollicaris* Bott, *Abh. Senckenb. Natur. Ges.* No. **526** : 41

Material Examined : 1ex., Madeshpura Koil Kere, B.N.P., Karnataka, 19.iii.2004, K. Rema Devi.

Diagnosis : Carapace flat, its length in the adult male about three-fourths of its greatest breadth and more than that in adult female, its depth is almost less than half of its length. Antero-lateral margins of carapace are well defined and irregularly crenulated. Cervical groove deep and broad running behind the lateral epibranchial tooth on either side. The epigastric and post orbital crests form one strong almost straight ridge running on either side.The chelipeds are unequal in both the sexes.

Distribution : India : Western Ghat: Karnataka.

Remarks : This species is endemic to western ghat.

7. ***Travancoriana schirnerae*** Bott 1969

1905. *Potamon (Potamonautes) cunicularis* Rathbun, *Nouv. Arch. Mus.,* (4)**7** : 184, T. 15. Fig. 10.

1910. *Paratelphusa (Barytelphusa) cunicularis* Alcock, *Cat. Ind. Decap. Crust. Ind. Mus.,* **1**(2) : 83; fig 56.

1970. *Travancoriana schirnerae* Bott, *Abh. Senckenb. Natur.* Ges. No. **526** : 41

Material examined : 2 exs., Kolar Road, Karnataka, 2.ii.1999, G. Thirumalai; 25 exs., K. Gudi, Karnataka, 24.ii.1999, S. Krishnan; 7 exs., Hanakere, Karnataka, 25.ii.1999, S. Krishnan; 5 exs., Hanakere, Karnataka, 1.iii.1999, S. Krishnan; 4 exs., Basavanagodu, 3.iv.1999, G. Thirumalai; 17 exs., Basavangodu, Karnataka, 3.iv.1999, G. Thirumalai, 1 ex., BRT Hills, Karnataka, 20.ii.2000, G. Thirumalai; 4 exs., Doddasempige, Karnataka, 2.iii.2000, 4exs., Gubamadugo, B.N.P., Karnataka, 20.iii.2004, K. Rema Devi; 2 exs., Muninagaram, B.N.P., Karnataka, 20.iii.2004, K. Rema Devi.

Diagnosis : Broad carapace,its length is less than three fourth its greatest breadth in both the sexes.The antero-lateral borders of the carapace are more convex and the lateral epibranchial tooth is not fully developed. Cervical groove is superficial and convergent, it does not clearly divide the post orbital crests from lateral epibranchial tooth.The species attains medium size between 2 to 3 inches.The fixed finger of the cheliped is rather broad and none of the teeth is enlarged.

Distribution : India : Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Maharashtra (Poona to Baroda).

Remarks : This species is the first record of occurrence from Karnataka state.

8. ***Spiralothelphusa hydrodroma*** (Herbst 1794)

1794. *Cancer hydrodromus* Herbst, *Naturgesch, Krabben und Krebse*, **2** : 164, T. 41 F.2.

1910. *Paratelphusa (Oziotelphusa) hydrodroma* Alcock, *Cat. Ind. Decap. Crust. Ind. Mus.*, **1**(2) : 97 [part].

1970. *Spiralothelphusa hydrodroma* Bott, *Abh. Senckenb. Nature Ges.* No. **526** : 97.

2006. *Spiralothelphusa hydrodroma* Bott: Srivastava & Krishnan, *Zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series*, **27** : 17-20.

2007. *Spiralothelphusa hydrodroma* Bott: Srivastava, *Zool. Surv. India, Fauna of Andhra Pradesh, State Fauna Series*, **5**(Part-4) : 245-2

Material Examined : 2 exs., Dodahosala lake,

Kolar, 10.iii.1978, M.B. Rao. 1ex. Shivaete R.F., Karnataka, 10.xii.1998, M.S. Ravichandran; 26 exs., Narasipurkera, Karnataka, 18.xi.1999, M.S. Ravichandran; 87 exs., Hosahaiti, Mysore, Karnataka, 20.xi.1999, M.B. Raghunathan; 24 exs., Chikkund, Mysore, Karnataka, 25.xi.1999 M.B. Raghunathan; 16 exs., Kolegal, Mysore, Karnataka, 26.xi.1999, M.B. Raghunathan; 5 exs., Chamrajnagar, Karnataka, 21.ii.2000, G. Thirumalai; 19 exs., Kollegal Road, Mysore, Karnataka, 24.ii.2000, G. Thirumalai; 1 ex., Attubuthupura, Karnataka, 25.xi.2000, G. Thirumalai; 2 exs., Belur, Bhomihalla, Karnataka, 31.iii.2001, G. Thirumalai. 1ex., Attubuthapura, Biligiri Rangasamy Temple Wildlife Sanctuary., Karnataka, 25.ii.2000, G. Thirumalai, 3 exs., Judukonta, B.N.P. Karnataka 16.iii.2004, K. Rema Devi.

Diagnosis : Carapace strongly convex its length is about two-third its greatest breadth in adult male; its depth is half of its length. The antero-lateral borders of the carapace convex ,cristiform smooth and very finely crenulated in young one. Cervical groove is distinct but superficial, it disappear behind the post orbital crests. The regions on the carapace are well defined.The epigastric crests sub-trenchant,subcresentic overlapping and slightly in advance of post- orbital crests.Chelipeds are unequal in both the sexes.

Distribution : India : Andhra Pradesh, Karnataka, Kerala, Pondicherry, Tamil Nadu, Uttar Pradesh (Allahabad), and West Bengal (Kolkata)

Elsewhere : Sri Lanka.

9. ***Oziotelphusa senex senex*** (Fabricius 1798)

1798. *Cancer senex* Fabricius, *Entom. Syst.* (*Suppl.*), 340.

1887. *Telphusa (Oziotelphusa) hippocastanum* Müller, *Verh. naturw. Ges. Basel,* **8** : 492, T.5 F.7.

1910. *Paratelphusa (Oziotelphusa) bouvieri* Alcock, *Cat. Ind. Decap. Crust. Ind. Mus.,***1 (2)**: 100, T.13 F.61.

1915. *Paratelphusa (Oziotelphusa) bouvieri* Roux, *Rev. suisse (Zool.)*, **23** : 279.

1960 *Paratelphusa ceylonensis* Fernando, *Ceylon J. Sci. (Biol.)*, **4** : 215, T.2, Abb. 13g, h, 18.

1970 *Oziotelphusa senex senex* Bott, *Abh. Senckenb. Nature Ges.* No. **526** : 101.

2007. *Oziotelphusa senex senex* Bott: Srivastava, *Zool. Surv. India, Fauna of Andhra Pradesh, State Fauna Series*, **5**(Part-4) : 245-248.

Material examined : 4 exs. Sultan tank, Kolar, Karnataka, 3.iii.1978, M.B. Rao; 6exs., Malkartank, Kolar, Karnataka, 3.iii.1978, M.B. Rao; 4 exs., Abdul Ali garden, Kolar Karnataka, 6.iii.1978, M.B. Rao. 12 exs. Kudi, Kolar, Karnataka, 10.iii.1978, M.B. Rao; 2 exs., Dodahosala Lake, Kolar Karnataka, 10.iii.1978, M.B. Rao; 9exs., Ganaratank, Kolar, Karnataka, 16.iii.1978, M.B. Rao; 2exs., Appaya Kunta Chikallapur, Kolar, Karnataka, 17.iii.1978, M.B. Rao; 4exs., Manchanpani tank, kolar, Karnataka, 18.iii.1978, M.B. Rao; 2 exs.,Gopal Tank, Kolar, Karnataka, 19.iii.1978, M.B. Rao; 6 exs., Gudi Bandi tank, Kolar, Karnataka, 22.iii.1978, M.B. Rao; 3exs., North Kanara, Hossure, Karnataka, 18.ix.78, R.M. Sharma; 25 exs., Belu, Hasan, Karnataka, 31.iii.2001, G. Thirumalai; 37 exs., Koilegal Road, Mysore, Karnataka, 24.ii.2000, G. Thirumalai; 4 Exs., Kayglahalli, B.N.P. Karnataka, 11.xi.2005, S. Prabhakaran: 4 Exs., B.N.P. Karnataka,10.xii.2005, S. Prabhakaran.

Diagnosis : Carapace is little convex and covered with fine furfuraceous pubescence, its antero-lateral borders are less convex and the lateral epibranchial tooth is very prominent and sharp. Some oblique striae are seen on the postero-lateral border of the carapace. The post orbital crest is straight and transverse and running almost toward lateral epibranchial tooth.The chelipeds are unequal in both the sexes.

Distribution : India : Andhra Pradesh, Karnataka, and Tamil Nadu.

Elsewhere : Sri Lanka.

Remarks : Predominantly distributed in Karnataka.

10. ***Oziotelphusa wagrakarowensis*** (Rathbun 1904)

1904. *Potamon (Potamon) wagrakarowensis* Rathbun, *Nouv. Arch. Mus*, (4) **6** : 292, Pl. 12, Fig. 4.

1910. *Paratelphusa (Oziotelphusa) hydrodroma* Alcock, *Cat. Ind. Decap. Crust. Ind. Mus.*, **1**(2) : 97 [part].

2005. *Oziotelphusa wagrakarowensis* Bahir &Yeo, *The Raffles Bulletin of Zoology* Supplement. No. **12** : 47-75

Material examined : Nil. The account stated from literature.

Diagnosis : Dorsal surface of carapace highly convex fore and aft ;anterior ;lateral carapace low in frontal view. Epibranchial tooth moderate in size sharp little above to post- orbital cristae .The post orbital cristae sharp, almost straight to curved. Male abdomen triangular with concave lateral border.

Distribution : India : Karnataka; Bellary area Wagrakarwour.

Elsewhere : Mysore,Tributary of Cauveri River at Hansur 50 km from Mysore on Madekeri-Mysore road.

SUMMARY

Ten species of Brachyuran (Freshwater) crabs belonging to six genera are dealt with this study based on the collection brought from the various surveys. Four species ie. *Gubernatoriana gubernatoris* (Alcock), *Travancoriana pollicaris* (Alcock), *T. schirnerae Bott* and *Oziotelphusa wagakarowensis* (Rathbun) are recorded for the first time from the Karnataka state. Among these two species ie. *Travancoriana pollicaris and Oziotelphusa wagakarowensis* are found endemic to the state.

ACKNOWLEDGEMENTS

The author is thankful to the Director, Zoological Survey of India and Officer-in-Charge, Southern Regional Center, Zoological survey of India, Chennai for providing the necessary facilities during this work. Thanks are also due to Sri S.S. Ghatak, Asst. Zoologist, Crustacea Div. ZSI, Kolkata for helping me in confirmation the identification. The author also express thanks to the Officer-in-Charge, WRC., ZSI Pune for providing the unidentified specimens of northern Karnataka for study.

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Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 79, 2013

INSECTA : EPHEMEROPTERA

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INTRODUCTION

Adult mayflies or short-lived insects are slender and uniform in appearance but the group is very diverse in morphology in the nymphal stage. Adults have triangular wings held vertically over the body and can not be folded flat. There are 2 or 3 long thread-like caudal filaments at the end of the abdomen in both sexes. The lateral pair is cerci; the middle one when present is called the terminal filament. Adults are unable to feed with their nonfunctional mouthparts. Males have a pair of clasper – like forceps at the end of the abdomen. Males often congregate in dense swarms during mating flights and mating lasts for a few seconds. Females land on the water surface after mating to release eggs and die while still in the water. Most species develop in fresh water, a few may occur in brackish water of estuaries.

World wide 2200 species occur where as from India 106 species are known (Varshney, 1998). The state of Karnataka however, remains a *terra incognito* as far as the ephemeropteran fauna is concerned. A perusal of literature reveals that only three species of two genera under 2 families are reported from Karnataka State (Hubbard & Peters, 1978).

Order EPHEMEROPTERA

Family BAETIDAE

1. *Cloeon bicolor* Kimmins
   Distribution : Karnataka.

Family EPHEMERIDAE

2. *Ephemera* (*Ephemera*) *annandalei* Chopra
   Distribution : Mysore, Karnataka
3. *Ephemera* (*Ephemera*) *immaculata* Eaton
   Distribution : Bangalore, Karnataka

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Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 81-84, 2013

INSECTA : ODONATA

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INTRODUCTION

Order Odonata (Dragonflies and Damselflies) are one of the prominent groups of insects in wetlands. They occupy diverse wetland habitats such as torrential streams, rivers, ponds, lakes, rainwater pools etc (Corbet, 1999). Odonata complete their life history in freshwater and terrestrial habitats. The larval stages are completed in wetland habitat and adult life is spend as aerial predator in the landscapes surrounding the wetlands. Each species is specific to a particular wetland habitat and they are very sensitive to the physico-chemical changes in their habitat quality. Their habitat specificity and sensitivity to changes in habitat quality makes them an ideal candidate for biomonitorying and biodiversity studies.

The Odonata fauna of Karnataka state is fairly well studied by Fraser (1933-1936). He described many new species, mainly from Kodagu (then Coorg) district. During 1980's and 1990's odonate fauna of Karnataka was explored by Western Regional Centre, Pune and Western Ghats Research Centre, Kozhikode of Zoological Survey of India. Results of these studies remained as museum records and never published formally. Recently odonate fauna of some protected areas of Karnataka were documented (Emiliyamma and Radhakrishnan, 2006, 2007a, 2007b, Subramanian, 2005 and 2007). Other than these faunisitc studies, there are some studies on ecology and conservation studies (Subramanian et.al. 2006, Subramanian and Sivaramakrishnan, 2005, Subramanian and Sivaramakrishnan, 2002). Here a comprehensive checklist of Odonata of Karnataka state is provided based on recent studies and from published literature.

SYSTEMATIC LIST

Order ODONATA

Suborder ZYGOPTERA

Family COENAGRIONIDAE

1. *Aciagrion hisopa* (Selys, 1876)
2. *Aciagrion occidentale* Laidlaw, 1919
3. *Agriocnemis femina* (Brauer, 1868)
4. *Agriocnemis lacteola* Selys, 1877
5. *Agriocnemis pieris* Laidlaw,1919
6. *Agriocnemis pygmaea* (Rambur, 1842)
7. *Agriocnemis splendidissima* Laidlaw,1919
8. *Archibasis oscillans* (Selys, 1877)
9. *Ceriagrion cerinorubellum* (Brauer, 1865)
10. *Ceriagrion coromandelianum* (Fabricius, 1798)
11. *Ceriagrion rubiae* Laidlaw, 1916
12. *Enallagma parvum* Selys, 1876
13. *Ischnura aurora* (Brauer, 1865)
14. *Ischnura senegalensis* (Rambur, 1842)
15. *Onychargia atrocyana* (Selys, 1865)
16. *Paracercion calamorum* (Ris,1916)
17. *Pseudagrion decorum* (Rambur, 1842)
18. *Pseudagrion hypermelas* Selys,1876
19. *Pseudagrion indicum* Fraser, 1924*
20. *Pseudagrion malabaricum* Fraser, 1924

21. *Pseudagrion microcephalum* (Rambur, 1842)
22. *Pseudagrion rubriceps* Selys, 1876

Family PLATYCNEMIDIDAE

23. *Copera marginipes* (Rambur, 1842)
24. *Copera vittata* Selys, 1863

Family PLATYSTICTIDAE

25. *Protosticta gravelyi* Laidlaw, 1915*
26. *Protosticta mortoni* Fraser, 1924*
27. *Protosticta sanguinostigma* Fraser, 1922*

Family PROTONEURIDAE

28. *Caconeura ramburi* (Fraser, 1922)*
29. *Disparoneura apicalis* (Fraser, 1924)*
30. *Disparoneura quadrimaculata* (Rambur, 1842)
31. *Elattoneura souteri* (Fraser, 1924)*
32. *Elattoneura tetrica* (Laidlaw, 1917)*
33. *Esme longistyla* Fraser, 1931*
34. *Melanoneura bilineata* Fraser, 1922*
35. *Phylloneura westermanni* (Selys, 1860)*
36. *Prodasineura verticalis* (Selys, 1860)

Family LESTIDAE

37. *Indolestes pulcherrimus* Fraser, 1924*
38. *Lestes dorothea* Fraser, 1924
39. *Lestes elatus* Hagen in Selys, 1862
40. *Lestes patricia* Fraser, 1924*
41. *Lestes praemorsus* Hagen in Selys, 1862
42. *Lestes viridulus* Rambur, 1842

Family CALOPTERYGIDAE

43. *Neurobasis chinensis* (Linnaeus, 1758)
44. *Vestalis apicalis* Selys
45. *Vestalis gracilis* (Rambur, 1842)
46. *V. gracilis montana* (Fraser, 1934)

Family CHLOROCYPHIDAE

47. *Calocypha laidlawi* (Fraser,1924)*
48. *Libellago lineata* (Burmeister, 1839)
49. *Rhinocypha bisignata* Hagen in Selys,1853

Family EUPHAEIDAE

50. *Euphaea dispar* (Rambur,1842)*
51. *Euphaea fraseri* (Laidlaw,1920)*
52. *Dysphaea ethela* Fraser, 1924

Suborder ANISOPTERA

Family AESHNIDAE

53. *Anaciaeschna jaspidea* (Burmeister, 1839)
54. *Anax guttatus* (Burmeister, 1839)
55. *Anax immaculifrons* Rambur, 1842
56. *Anax parthenope* (Selys, 1839)
57. *Gynacantha bayadera* Selys,1891
58. *Gynacantha dravida* Lieftinck,1960
59. *Hemianax ephippiger* (Burmeister, 1839)

Family CHLOROGOMPHIDAE

60. *Chlorogomphus campioni* (Fraser,1924)*

Family CORDULIIDAE

61. *Idionyx corona* Fraser,1921*
62. *Idionyx galeata* Fraser,1924*
63. *Idionyx saffronata* Fraser,1924*
64. *Macromidia donaldi* (Fraser,1924)*

Family GOMPHIDAE

65. *Acrogomphus fraseri* Laidlaw,1925*
66. *Asiagomphus nilgiricus* (Laidlaw,1922)*
67. *Burmagomphus cauvericus* Fraser,1926*
68. *Burmagomphus laidlawi* Fraser,1924*
69. *Burmagomphus pyramidalis* Laidlaw,1922
70. *Cyclogomphus wilkinsi* Fraser,1926
71. *Gomphidia fletcheri* Fraser,1923*
72. *Gomphidia kodaguensis* Fraser,1923*
73. *Heliogomphus promelas* (Selys,1873)*
74. *Ictinogomphus rapax* (Rambur, 1842)
75. *Macrogomphus annulatus* (Selys,1854)
76. *Macrogomphus wynaadicus* Fraser,1924*
77. *Megalogomphus hannyngtoni* (Fraser,1923)*
78. *Merogomphus longistigma* (Fraser,1922)*
79. *Microgomphus souteri* Fraser,1924*
80. *Onychogomphus acinaces* (Laidlaw,1922)*
81. *Onychogomphus nilgiriensis* (Fraser,1922)*
82. *Paragomphus lineatus* (Selys,1850)

Family LIBELLULIDAE

83. *Acisoma panorpoides* Rambur, 1842
84. *Aethriamanta brevipennis* (Rambur, 1842)
85. *Brachydiplax sobrina* (Rambur, 1842)
86. *Brachythemis contaminata* (Fabricius,1793)
87. *Bradinopyga geminata* (Rambur, 1842)
88. *Cratilia lineata* Foerster, 1903
89. *Crocothemis servilia* (Drury, 1770)
90. *Diplacodes lefebvrii* (Rambur,1842)
91. *Diplacodes nebulosa* (Fabricius, 1793)
92. *Diplacodes trivialis* (Rambur,1842)
93. *Epithemis mariae* (Laidlaw,1915)*
94. *Hydrobasileus croceus* (Brauer, 1867)
95. *Hylaeothemis indica* Fraser,1946*
96. *Indothemis carnatica* (Fabricius, 1798)
97. *Indothemis limbata* (Selys, 1891)
98. *Lathrecista asiatica* (Fabricius, 1798)
99. *Macrodiplax cora* (Brauer,1867)
100. *Neurothemis fulvia* (Drury, 1773)
101. *Neurothemis intermedia* (Rambur, 1842)
102. *Neurothemis tullia* (Drury, 1773)
103. *Onychothemis testacea* Laidlaw, 1902
104. *Orthetrum chrysis* (Selys, 1891)
105. *Orthetrum glaucum* (Brauer, 1865)
106. *Orthetrum luzonicum* (Brauer, 1868)
107. *Orthetrum pruinosum* (Burmeister,1839)
108. *Orthetrum sabina* (Drury, 1770)
109. *Orthetrum triangulare* (Selys, 1878)
110. *Palpopleura sexmaculata* (Fabricius, 1787)
111. *Pantala flavescens* (Fabricius, 1798)
112. *Potamarcha congener* (Rambur, 1842)
113. *Rhodothemis rufa* (Rambur, 1842)
114. *Rhyothemis triangularis* Kirby, 1889
115. *Rhyothemis variegata* (Linnaeus, 1763)
116. *Sympetrum fonscolombii* (Selys, 1840)
117. *Sympetrum hypomelas* (Selys, 1884)
118. *Tholymis tillarga* (Fabricius, 1798)
119. *Tramea basilaris* (Palisot de Beauvois, 1805)
120. *Tramea limbata* (Desjardins,1832)
121. *Trithemis aurora* (Burmeister, 1839)
122. *Trithemis festiva* (Rambur, 1842)
123. *Trithemis kirbyi* Selys, 1891
124. *Trithemis pallidinervis* (Kirby, 1889)
125. *Tetrathemis platyptera* Selys, 1878
126. *Urothemis signata* (Rambur, 1842)
127. *Zygonyx iris* Selys,1869
128. *Zygonyx torrida* (Kirby,1889)
129. *Zyxomma petiolatum* Rambur, 1842

Family MACROMIIDAE

130. *Epophthalmia vittata* Burmeister,1839
131. *Macromia bellicosa* Fraser,1924*
132. *Macromia cingulata* Rambur,1842
133. *Macromia ellisoni* Fraser,1924*
134. *Macromia flavocolorata* Fraser,1922*
135. *Macromia ida* Fraser,1924*
136. *Macromia indica* Fraser,1924
137. *Macromia irata* Fraser,1924*

RESULTS AND DISCUSSION

Current study documents 137 species of odonates under 78 genera and 14 families from Karnataka. Out of this 137 species, 41 are endemic to Western Ghats (marked with asterisk*). The Zygoptera comprises of 27 genera and 52 species including 17 species endemics and the Anisoptera comprises of 51 genera and 85 species, with 24 endemics. The families Gomphidae, Corduliidae, Macromiidae, Platystictidae and Protoneuridae has high endemism. The genera *Macromia* (7 sp.), *Orthetrum* (6 sp.), *Pseudagrion* (6sp.) and *Agriocnemis* (5sp.) are species rich.

The Odonata fauna of Karnataka part of the Western Ghats and Deccan plateau are very distinct. All the endemic species are restricted to hill streams and forests of the Western Ghats. They are characterised by genera such as *Euphaea*, *Idionyx*, *Macrogomphus*, *Microgomphus*, *Platysticta* etc. These genera are specialized for torrential hill streams and found nowhere else in the state. These hill streams are also habitats for Gondwanian relicts such as *Phylloneura*, *Melanoneura* and *Caconeura*. On the other hand, the wetlands of the Deccan

plateau are mostly dominated by widespread generalist genera of libullids and coenagrionids such as *Tramea*, *Trithemis*, *Neurothemis*, *Rhyothemis*, *Coenagrion*, *Pseudagrion, Ischneura* etc.

The hill streams of Kodagu, Mangalore, Udupi, Hassan and Uttar Kannada districts harbour high diversity, endemism and evolutionarily significant species of odonates and requires conservation attenation.

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Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 85-86, 2013

INSECTA : PLECOPTERA

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INTRODUCTION

Plecoptera are commonly known as Stoneflies and mostly found in high altitude hill streams of cold temperate regions. The nymphs of these insects are seen on stony surfaces and adults on bushes and tree trunks near the streams. The adults are weak fliers and diurnal in nature with some exceptions. Adults feed on algae, lichen and foliage, many of them may not take any meal in their life time as their life span is very short. The occurrence of brachypterous or wingless forms is common during winter months.

Probably due to scant availability of these insects not much work has been done in India. About 3402 valid species under 388 valid genera spread over 28 valid families are recorded from the world (Dewalt, *et al,* 2009). Of which, 116 species of 25 genera under 8 families are known from India (Chandra & Sharma, 2009). The Karnataka fauna of stoneflies is known by only 3 species of three genera under one family.

Order PLECOPTERA

Family PERLIDAE Mclachlan, 1886

1. ***Chinoperla nigriceps*** (Banks)

1914. *Neoperla nigriceps* Banks, *Proc. Acad. Nat. Sci.*, **66** : 610.

1930. *Neoperla tristis* Navas, *Mem. Pont. Acad. Rom. Nuov. Lincei*, (2)**14** : 431.

1981. *Chinoperla nigriceps* : Zwick, *Oriental Insects*, **15**(2) : 115.

Distribution : Karnataka : Belgaum.

2. ***Neoperla moesta*** Banks

1939. *Neoperla moesta* Banks, *Bull. Mus. Comp. Zool.*, **85** (7) : 447-448

1975. *Neoperla moesta* : Jewett, *Oriental Insects*, **9**(2) : 131.

1981. *Neoperla moesta* : Zwick, *Oriental Insects*, **15**(2) : 115.

Distribution : Karnataka : Belgaum, Bhadravati, Mysore, Shimoga.

3. ***Phanoperla peniculus*** Kawai

1968. *Phanoperla peniculus* Kawai, *Oriental Insects*, **2**(2) : 115-117.

1975. *Phanoperla peniculus* : Jewett, *Oriental Insects*, **9**(2) : 128-129.

Distribution : Karnataka : Bhadravati, Mysore.

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Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 87-96, 2013

INSECTA : ORTHOPTERA

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INTRODUCTION

Orthopterans are commonly known as grasshoppers, crickets, mole-crickets, pigmy-mole crickets and grouse locusts. The major work on Orthopteran fauna of India is published by Kirby (1914) and Chopard (1969). However, a little information on Orthopteran fauna from Karnataka has been published by Usman & Puttarudraiah (1955), Vastrad (1986), Kumar & Vikraktamath (1990, 1991) and Vastrad *et al.* (1991).

A number of workers including Bhowmik (1985a, b, 1986), Shishodia & Hazra (1986), Shishodia & Mandal (1990), Mandal *et al.* (1990, 2007), Shishodia (1991, 1997a, b, 2000), Hazra *et al.* (1993, 1995), Vasanth (1993), Schmidt (1998), Shishodia & Tandon (2000), Dey & Hazra (2003), Mandal & Yadav (2007), Gupta *et al.* (2008), Shishodia *et al.* (2010) have also worked on the Indian fauna and various states also included the distribution of some species in Karnataka state.

This paper presents the comprehensive account on Orthopteran fauna of Karnataka along with their known distribution in the state. Altogether, 159 species/subspecies of Orthoptera belonging to 111 genera and 10 families are on listed.

Sl. No.	Families	Number of genera	Number of species
1.	Acrididae	36	53
2.	Chorotypidae	1	1
3.	Pyrgomorphidae	8	9
4.	Tetrigidae	9	13
5.	Tridactylidae	1	2
6.	Gryllidae	24	40
7.	Trigonidiidae	5	7
8.	Gryllotalpidae	2	2
9.	Mogoplistidae	3	5
10.	Tettigoniidae	16	19
	Total	**111**	**159**

SYSTEMATIC LIST

Order ORTHOPTERA

Suborder CAELIFERA

Superfamily ACRIDOIDEA

Family ACRIDIDAE

Subfamily ACRIDINAE

Genus ***Julea*** Bolivar, 1914

1. *Julea indica* Bolivar, 1914: Karnataka

Genus ***Orthochtha*** Karsch, 1891

2. *Orthochtha ramachandrae* Popov, 1981: Karnataka

Genus ***Pasiphimus*** Bolivar, 1914

3. *Pasiphimus sagittaeformis* Bolivar, 1914 : Karnataka

Genus ***Acrida*** Linnaeus, 1758

4. *Acrida exaltata* (Walker, 1859) : Karnataka.

Genus ***Phlaeoba*** Stål, 1860

5. *Phlaeoba ramakrishnai* Bolivar, 1914: Karnataka

6. *Phlaeoba rotundata* Uvarov, 1929 : Mysore : Karnataka

Genus ***Truxalis*** Fabricius, 1775

7. *Truxalis indica* (Bolivar, 1902) : Bellary.

Genus ***Capulica*** Bolivar, 1918

8. *Capulica alata* Uvarov, 1929 : Mysore Plateau.

9. *Capulica pulla* Bolivar, 1918 : Bellary : Kamalapuraur.

Genus ***Bababuddinia*** Bolivar, 1918

10. *Bababuddinia bizonata* Bolivar, 1918 : Attakati, Mysore : Bababuddin Hills, Mudumalai, Gudalur.

Subfamily CALLIPTAMINAE

Genus ***Acorypha*** Krauss, 1877

11. *Acorypha glaucopsis* (Walker, 1870) : Karnataka.

Subfamily CATANTOPINAE

Genus ***Opharicus*** Bolivar, 1918

12. *Opharicus ballardi* Bolivar, 1918 : Kamalapuram and Yemmiganur, Bellary District.

Genus ***Pachyacris*** Uvarov, 1923

13. *Pachyacris vinosa* (Walker, 1870) : Karnataka.

14. *Pachyacris violascens* (Walker, 1870) : Karnataka.

Genus ***Palniacris*** Henry, 1940

15. *Palniacris maculatus* Henry, 1940: Karnataka.

Genus ***Oxyrrhepes*** Stål, 1873

16. *Oxyrrhepes obtusa* (De Haan, 1842) : Karnataka.

Genus ***Xenocatantops*** Dirsh & Uvarov, 1953

17. *Xenocatantops humilis humilis* (Serville, 1839) : Karnataka.

18. *Xenocatantops henryi* (Bolivar, 1918) : Karnataka.

Genus ***Diabolocatantops*** Jago, 1984

19. *Diabolocatantops innotabilis* (Walker, 1870) : Karnataka.

20. *Diabolocatantops pulchellus* (Walker, 1870) : Karnataka.

Genus ***Stenocatantops*** Dirsh & Uvarov, 1953

21. *Stenocatantops splendens* (Thunberg, 1915) : Karnataka.

Tribe **Genimenini** Li, X. J. & X. C. Yin, 2009

Genus ***Genimen*** Bolivar, 1918

22. *Genimen prasinum* Bolivar, 1918 : Gudalur, Nilgiris.

Tribe **Paraconophymatini** Otte, 1995

Genus ***Paraconophyma*** Uvarov, 1921

23. *Paraconophyma scabra* (Walker, 1870) : Karnataka.

Subfamily COPTACRIDINAE

Genus ***Coptacra*** Stål, 1873

24. *Coptacra ensifera* Bolivar, 1902 : Belgaum.

Genus ***Eucoptacra*** Bolivar, 1902

25. *Eucoptacra ceylonica* Kirby, 1914 : Dharwad.

26. *Eucoptacra praemorsa* (Stål, 1860) : Karnataka.

Subfamily CYRTACANTHACRIDINAE

Genus ***Anacardium*** Uvarov, 1923

27. *Anacardium flavescens* (Fabricius, 1773) : Karnataka.

Genus ***Cyrtacanthacris*** Walker, 1870

28. *Cyrtacanthacris tatarica tatarica* (Linnaeus, 1758) : Karnataka.

Subfamily EYPREPOCNEMIDINAE

Genus ***Tylotropidius*** Stål, 1860

29. *Tylotropidius varicornis* (Walker, 1870) : Karnataka

Tribe **Eyprepocnemidini** Brunner von Wattenwyl, 1893

30. *Eyprepocnemis alacris alacris* (Serville, 1839) : Karnataka

Subfamily GOMPHOCERINAE

Genus ***Leva*** Bolivar, 1909

31. *Leva indica* Bolivar, 1902 : Mysore.

Genus ***Stenohippus*** Uvarov, 1926

32. *Stenohippus trapezoids* (Bolivar, 1914) : Karnataka

Genus ***Gonista*** Bolivar, 1898

33. *Gonista sagitta* (Uvarov, 1912) : Mysore Plateau.

Genus ***Aulacobothrus*** Bolivar, 1902

34. *Aulacobothrus luteipes inferrus* Bolivar, 1902 : Karnataka.

35. *Aulacobothrus luteipes luteipes* (Walker, 1871) : Karnataka.

36. *Aulacobothrus socius* (Bolivar, 1902) : Karnataka.

Genus ***Crucinotacris*** Jago, 1996

37. *Crucinotacris decisa* (Walker, 1871) : Karnataka.

Genus ***Leinotacris*** Jago, 1996

38. *Leinotacris bolivari* Uvarov, 1921 : Karnataka.

Subfamily HEMIACRIDINAE

Genus ***Calamippa*** Henry, 1940

39. *Calamippa prasina* (Bolivar, 1902) : Gudalur District. Nadghnai Ghat, Dhimbam, Biligirirangam Hills.

Genus ***Clonacris*** Uvarov, 1943

40. *Clonacris kirbyi* (Finot, 1903) : Karnataka.

Genus ***Hieroglyphus*** Krauss, 1877

41. *Hieroglyphus banian* (Fabricius, 1798) : Karnataka.

42. *Hieroglyphus concolor* (Walker, 1870) : Canara.

43. *Hieroglyphus nigropletus* Bolivar, 1912: Karnataka.

Genus ***Parahieroglyphus*** Carl, 1916

44. *Parahieroglyphus colemani* (Bolivar, 1912) : Karnataka

Subfamily OEDIPODINAE

Genus ***Chloebora*** Saussure, 1884

45. *Chloebora crassa* (Walker, 1870) : Belgaum.

Genus ***Dittopternis*** Saussure, 1884

46. *Dittopternis venusta* (Walker, 1870) : Mysore.

Genus ***Aiolopus*** Fieber, 1853

47. *Aiolopus thalassinus tamulus* (Fabricius, 1798) : Karnataka.

Genus ***Gastrimargus*** Saussure, 1884

48. *Gastrimargus marmoratus* (Thunberg, 1815) : Karnataka.

Genus ***Oedaleus*** Fieber, 1853

49. *Oedaleus abruptus* (Thunberg, 1815) : Belgaum.

Tribe **Epacromiini** Brunner von Wattenwyl, 1893

Genus ***Heteropternis*** Stål, 1873

50. *Heteropternis respondens respondens* (Walker, 1859) : Karnataka.

Tribe **Trilophidiini** Shumakov, 1963

Genus ***Trilophidia*** Stål, 1873

51. *Trilophidia annulata* (Thunberg, 1815) : Belgaum.

Subfamily OXYINAE

Genus ***Chitaura*** Bolivar, 1918

52. *Chitaura indica* Uvarov, 1929 : Mysore : Coorg.

Genus ***Oxya*** Serville, 1831

53. *Oxya fuscovittata* (Marschall, 1836) : Karnataka.

54. *Oxya hyla hyla* Serville, 1831: Karnataka.

55. *Oxya japonica japonica* (Thunberg, 1824) : Siddapur.

56. *Oxya nitidula* (Walker, 1870) : Karnataka.

Subfamily SPATHOSTERNINAE

Tribe **Spathosternini** Rehn, 1957

Genus ***Spathosternum*** Krauss, 1877

57. *Spathosternum abbreviatum* Uvarov, 1929 : Masinigudi : Karnataka.

58. *Spathosternum prasiniferum prasiniferum* (Walker, 1871): Karnataka.

Subfamily TROPIDOPOLINAE

Tribe **Tristriini** Mishchenko, 1945

Genus ***Tristria*** Stål, 1873

59. *Tristria pulvinata* (Uvarov, 1921) : Karnataka.

Superfamily EUMASTACOIDEA

Family CHOROTYPIDAE

Subfamily CHOROTYPINAE

Tribe **Chorotypini** Stål, 1873

Genus ***Phyllochoreia*** Westwood, 1839

60. *Phyllochoreia sp.* : Mysore.

Superfamily PYRGOMORPHOIDEA

Family PYRGOMORPHIDAE

Subfamily ORTHACRIDINAE

Tribe **Popoviini** Kevan & Akbar, 1964

Genus ***Colemania*** Bolivar, 1910

61. *Colemania sphenarioides* Bolivar, 1910 : Bellary, Mysore.

Genus ***Ramakrishnaia*** Bolivar, 1918

62. *Ramakrishnaia gracilis* (Kevan, 1964) : Coorg.

63. *Ramakrishnaia notabilis* Bolivar, 1918 : Mysore.

Subfamily PYRGOMORPHINAE

Tribe **Atractomorphini** Bolivar, 1905

Genus ***Atractomorpha*** Saussure, 1862

64. *Atractomorpha crenulata* (Fabricius, 1793) : Karnataka.

Genus ***Feacris*** Kevan, 1969

65. *Feacris malabarensis* (Kevan, 1953) : Mysore.

Genus ***Chrotogonus*** Serville, 1838

Subgenus ***Chrotogonus*** Serville, 1838

66. *Chrotogonus* (*Chrotogonus*) *oxypterus* (Blanchard, 1836) : Bellary.

Tribe **Poekilocerini** Bolivar, 1884

Genus ***Poekilocerus*** Serville, 1831

67. *Poekilocerus pictus* (Fabricius, 1775) : Karnataka.

Tribe **Pyrgomorphini** Brunner von Wattenwyl, 1874

Genus ***Pyrgomorpha*** Serville, 1838

68. *Pyrgomorpha* (*Pyrgomorpha*) *conica* (Olivier, 1791) : Karnataka.

Genus ***Zarytes*** Bolivar, 1904

69. *Zarytes squalinus squalinus* (Saussure, 1884) : Karnataka.

Superfamily TETRIGOIDEA

Family TETRIGIDAE

Subfamily SCELIMENINAE

Tribe **Thoradontini** Kevan, 1966

Genus ***Bolivaritettix*** Günther, 1939

70. *Bolivaritettix insignis* (Kirby, 1914) : Karnataka.

71. *Bolivaritettix javanicus* (Bolivar, 1909) : Karnataka.

Genus ***Eucriotettix*** Hebard, 1929

72. *Eucriotettix exsertus* (Bolivar, 1902) : Attakatti.

73. *Eucriotettix flavopictus* (Bolivar, 1902) : Karnataka.

74. *Eucriotettix maculatus* (Kirby, 1914) : Siddapur.

75. *Eucriotettix spinilobus* (Hancock, 1904) : Karnataka.

Genus ***Thoradonta*** Hancock, 1909

76. *Thoradonta spiculoba,* Hancock, 1912 : Mudumalai.

Tribe **Scelimenini** Hancock, 1907

Genus ***Euscelimena*** Günther, 1938

77. *Euscelimena harpago* (Serville, 1839) : Karnataka.

Subfamily TETRIGINAE

Genus ***Ergatettix*** Kirby, 1914

78. *Ergatettix dorsiferus* (Walker, 1871) : Karnataka.

Genus ***Hedotettix*** Bolivar, 1887

79. *Hedotettix gracilis* (Haan, 1842) : Karnataka.

80. *Hedotettix punctatus* Hancock, 1909 : Karnataka.

Tribe **Tetrigini** Serville, 1838

Genus ***Copotettix*** Bolivar, 1887

81. *Copotettix annandalei* Hancock, 1915 : Karnataka.

Genus ***Paratettix*** Bolivar, 1887

82. *Paratettix cingalensis* (Walker, 1871) : Karnataka.

Infraorder TRIDACTYLIDEA

Superfamily TRIDACTYLOIDEA Brulle, 1835

Family TRIDACTYLIDAE Brulle, 1835

Subfamily TRIDACTYLINAE Brulle, 1835

Genus ***Xya*** Latreille, 1809

83. *Xya nigraenea* (Walker, 1871) : Karnataka.

84. *Xya riparia* (Saussure, 1877) : Dharward : Mysore.

Suborder ENSIFERA

Superfamily GRYLLOIDEA

Family GRYLLIDAE

Subfamily GRYLLINAE

Tribe **Gryllini** Laicharting, 1781

Genus ***Acanthoplistus*** Saussure, 1877

85. *Acanthoplistus birmanus* Saussure, 1877: Karnataka

Genus ***Depressogryllus*** Gorochov, 1988

86. *Depressogryllus depressiceps* (Ebner, 1935) : Karnataka.

Genus ***Gryllus*** Linnaeus, 1758

Subgenus ***Gryllus*** Linnaeus, 1758

87. *Gryllus* (*Gryllus*) *bimaculatus* De Geer, 1773 : Bengaluru, Shimoga.

88. *Gryllus* (*Gryllus*) *quadrimaculatus* Saussure, 1877: Mysore.

Genus ***Gymnogryllus*** Saussure, 1877

89. *Gymnogryllus kashmirensis* Bhowmik, 1967 : Mysore.

Genus ***Itaropsis*** Chopard, 1925

90. *Itaropsis tenella* (Walker, 1869) : Mysore : Nalparai.

Genus ***Loxoblemmus*** Saussure, 1877

91. *Loxoblemmus equestris* Saussure, 1877: Mysore : Valparai.

Genus ***Phonarellus*** Gorochov, 1983

Subgenus ***Phonarellus*** Gorochov, 1983

92. *Phonarellus* (*Phonarellus*) *erythrocephalus erythrocephalus* (Serville, 1839) : Shimoga.

93. *Phonarellus* (*Phonarellus*) *humeralis* (Walker, 1871) : Shimoga.

94. *Phonarellus* (*Phonarellus*) *minor* Chopard, 1959 : Mysore.

Genus ***Plebeiogryllus*** Randell, 1964

95. *Plebeiogryllus guttiventris guttiventris*(Walker, 1871) : Mysore : Karnataka.

Genus ***Tarbinskiellus*** Gorochov, 1983

96. *Tarbinskiellus orientalis* (Burmeister, 1838) : Shimoga.

97. *Tarbinskiellus portentosus* (Lichtenstein, 1796) : Karnataka.

98. *Tarbinskiellus terrificus* (Walker, 1869) : Mysore : Bhadravati.

Genus ***Teleogryllus*** Chopard, 1961

Subgenus ***Brachyteleogryllus*** Gorochov, 1988

99. *Teleogryllus* (*Brachyteleogryllus*) *occipitalis* (Serville, 1838) : Karnataka.

Subgenus ***Macroteleogryllus*** Gorochov, 1988

100. *Teleogryllus* (*Macroteleogryllus*) *mitratus* (Burmeister, 1838) : Singla : Shimoga.

Genus ***Velarifictorus*** Randell, 1964

Subgenus ***Velarifictorus*** Randell, 1964

101. *Velarifictorus* (*Velarifictorus*) *aspersus* (Walker, 1869) : Mysore : Shimoga and Valparai.

102. *Velarifictorus* (*Velarifictorus*) *ceylonicus* (Chopard, 1928) : Mysore.
103. *Velarifictorus* (*Velarifictorus*) *fallax* (Chopard, 1969) : Mysore.

Genus ***Gryllodes*** Saussure, 1874

104. *Gryllodes sigillatus* (Walker, 1869) : Mysore : Shimoga.
105. *Gryllodes supplicans* (Walker, 1859) : Shimoga.

Genus ***Gryllopsis*** Chopard, 1928

106. *Gryllopsis femorata* Chopard, 1935: Mysore.
107. *Gryllopsis flavifrons* Chopard, 1969 : Coorg.
108. *Gryllopsis furcata* (Saussure, 1877) : Shimoga.

Genus ***Modicogryllus*** Chopard, 1961

Subgenus ***Modicogryllus*** Chopard, 1961

109. *Modicogryllus* (*Modicogryllus*) *confirmatus* (Walker, 1859) : Shimoga.
110. *Modicogryllus* (*Modicogryllus*) *facialis* (Walker, 1871) : Karnataka.
111. *Modicogryllus* (*Modicogryllus*) *flavus* (Chopard, 1936) : Mysore : Nedungadu.

Subgenus ***Promodicogryllus*** Gorochov, 1986

112. *Modicogryllus* (*Promodicogryllus*) *bucharicus* (Bei-Bienko, 1933) : Karnataka.
113. *Modicogryllus* (*Promodicogryllus*) *ehsani* (Chopard, 1961) : Mysore : Nedungadu.

Genus ***Turanogryllus*** Tarbinskii, 1940

114. *Turanogryllus fascifrons* (Chopard, 1969) : Karnataka
115. *Turanogryllus maculithorax* Chopard, 1969 : Shimoga : Kodikam mounts.

Subfamily LANDREVINAE

Tribe **Landrevini** Gorochov, 1882

Genus ***Landreva*** Walker, 1869

116. *Landreva semialata* Chopard, 1928 : Canara.

Subfamily SCLEROGRYLLINAE

Genus ***Sclerogryllus*** Gorochov, 1985

117. *Sclerogryllus coreaceus* (Haan, 1842) : Karnataka.
118. *Sclerogryllus punctatus* Brunner Von Wattenwyl, 1893 : Mysore : Coorg.

Subfamily PODOSCIRTINAE

Tribe **Podoscirtini** Saussure, 1878

Genus ***Madasumma*** Walker, 1869

119. *Madasumma ventralis* Walker, 1869 : Karnataka.

Genus ***Prozvenella*** Gorochov, 2002

120. *Prozvenella soror* (Chopard, 1969) : Karnataka

Subfamily NEMOBIINAE

Tribe **Pteronemobiini** Otte & Alexander, 1983

Genus ***Dianemobius*** Vickery, 1973

121. *Dianemobius csikii* (Bolivar, 1901) : Nedungadu.
122. *Dianemobius fascipes* (Walker, 1869) : Mysore: Shimoga.

Genus ***Polionemobius*** Gorochov, 1983

123. *Polionemobius taprobanensis* (Walker, 1869) : Mysore: Shimoga.

Genus ***Pteronemobius*** Jacobson and Bianchi, 1905

Subgenus ***Pteronemobius*** Jacobson, 1904

124. *Pteronemobius* (*Pteronemobius*) *heydeni concolor* (Walker, 1871) : Mysore: Shimoga.

Genus ***Stenonemobius*** Gorochov, 1981

Subgenus ***Ocellonemobius*** Gorochov, 1981

125. *Stenonemobius* (*Ocellonemobius*) *bicolor bicolor* (Saussure, 1877) : Karnataka.

Genus ***Paranemobius*** Saussure, 1877

126. *Paranemobius pictus* (Saussure, 1877) : Bengaluru : Shimoga.
127. *Paranemobius vicinus* Chopard, 1928 : Mysore : Coorg.

Subfamily OECANTHINAE

Tribe **Oecanthini** Blanchard, 1845

Genus ***Oecanthus*** Serville, 1831

128. *Oecanthus indicus* Saussure, 1878 : Karnataka.

Subfamily EUSCYRTINAE

Genus ***Euscyrtus*** Guérin Meneville, 1844

Subgenus ***Osus*** Gorochov, 1987

129. *Euscyrtus* (*Osus*) *concinnus* (Haan, 1842) : Mysore : Mudumalai.

Family TRIGONIIDAE

Tribe **Trigonidiini** Saussure, 1874

Genus ***Amusurgus*** Brunner Von Wattenwyl, 1893

Subgenus ***Amusurgus*** Brunner Von Wattenwyl, 1893

130. *Amusurgus* (*Amusurgus*) *fulvus* Chopard, 1969 : Mysore.

131. *Amusurgus* (*Amusurgus*) *unicolor* Chopard, 1925 : Mysore : Coorg.

Genus ***Anaxipha*** Saussure, 1874

132. *Anaxipha longipennis* (Serville, 1839) : Shimoga.

Genus ***Homoeoxipha*** Saussure, 1874

133. *Homoeoxipha lycoides* (Walker, 1869) : Mysore : Valparai.

Genus ***Metiochodes*** Chopard, 1931

134. *Metiochodes greeni* (Chopard, 1925) : Shimoga.

Genus ***Trigonidium*** Rambur, 1838

135. *Trigonidium humbertianum* (Saussure, 1878) : Karnataka.

Subgenus ***Trigonidium*** Rambur, 1839

136. *Trigonidium* (*Trigonidium*) *cicindeloides* Rambur, 1839: Mysore.

Family GRYLLOTALPIDAE

Subfamily GRYLLOTALPINAE

Genus ***Gryllotalpa*** Latreille, 1802

137. *Gryllotalpa africana* Beauvois, 1805 : Shimoga.

Subfamily SCAPTERISCINAE

Genus ***Indioscaptor*** Nickle, 2003

138. *Indioscaptor leptodactylus* Chopard, 1928 : Shimoga.

Family MOGOPLISTIDAE

Subfamily MOGOPLISTINAE

Genus ***Derectaotus*** Chopard, 1936

139. *Derectaotus ceylonicus* (Chopard, 1928) : Karnataka.

140. *Derectaotus indicus* (Chopard, 1928) : Mysore.

Superfamily TETTIGONIOIDEA

Family TETTIGONIIDAE

Subfamily CONOCEPHALINAE

Tribe **Conocephalini** Burmeister, 1838

Genus ***Conocephalus*** Thunberg, 1815

Subgenus ***Anisoptera*** Latreille, 1829

141. *Conocephalus* (*Anisoptera*) *honorei* (Bolivar, 1900) : Karnataka.

Subfamily HEXACENTRINAE

Genus ***Euhexacetrus*** Hebard, 1922

142. *Euhexacentrus annulicornis* (Stål, 1877) : Karnataka.

Subfamily MECONEMATINAE

Tribe **Meconematini** Burmeister, 1838

Genus ***Nefateratura*** Ingrisch & Shishodia, 2000

143. *Nefateratura mesembrina* Kevan & Jin, 1993: South Coorg, Ammatti.

Genus ***Indokuzicus*** Gorochov, 1998

144. *Indokuzicus militaris* (Bolivar, 1900) : South Coorg, Ammatti.

Genus ***Xiphidiopsis*** Redtenbacher, 1891

Subgenus ***Xiphidiopsis*** Redtenbacher, 1891

145. *Xiphidiopsis* (*Xiphidiopsis*) *straminula* (Walker, 1871) : Karnataka.

Genus ***Xizicus*** Gorochov, 1993

Subgenus ***Axizicus*** Gorochov, 1998

146. *Xizicus* (*Axizicus*) *simplicicercts* (Kevan, 1993) : South Coorg, Ammatti.

Subfamily MECOPODINAE

Tribe **Mecopodini** Walker, 1871

Genus ***Mecopoda*** Serville, 1831

147. *Mecopoda elongata elongata* (Linnaeus, 1758) : Karnataka.

Subfamily PHANEROPTERINAE

Genus ***Himertula*** Uvarov, 1940

148. *Himertula kinneari* (Uvarov, 1923) : Karnataka.

Genus ***Letana*** Walker, 1869

149. *Letana atomifera* (Brunner Von Wattenwyl, 1878) : Bengaluru, Bellary.

150. *Letana bulbosa* Ingrisch,1990 : Karnataka.

Tribe **Elimaeini** Brunner Von Wattenwyl, 1891

Genus ***Elimaea*** Stål, 1874

Subgenus ***Elimaea*** Karny, 1926

151. *Elimaea* (*Elimaea*) *securigera* Brunner Von Wattenwyl, 1878 : Karnataka.

Tribe **Ducetiini** Brunner Von Wattenwyl, 1878

Genus ***Ducetia*** Stål, 1874

152. *Ducetia japonica* (Thunberg, 1815) : Bellary, Coorg, Lallar.

Tribe **Holochlorini** Brunner Von Wattenwyl, 1878

Genus ***Holochlora*** Stål, 1873

153. *Holochlora indica* Kirby, 1906 : Karnataka.

154. *Holochlora spectabilis* (Walker, 1869) : Karnataka.

Tribe **Phaneropterini** Burmeister, 1838

Genus ***Phaneroptera*** Serville, 1831

Subgenus ***Phaneroptera*** Serville, 1831

155. *Phaneroptera* (*Phaneroptera*) *gracilis* Burmeister, 1838 : Karnataka.

Tribe **Trigonocoryphini** Bei-Bienko, 1954

Genus ***Trigonocorypha*** Stål, 1874 (1873)

156. *Trigonocorypha unicolor* (Stoll, 1787) : Karnataka.

Subfamily PSEUDOPHYLLINAE

Tribe **Cocconotini** Brunner von Wattenwyl, 1895

Genus ***Meroncidius*** Serville, 1831

157. *Meroncidius ochraceous* Stål, 1813: Karnataka.

Tribe **Cymatomerini** Brunner von Wattenwyl, 1895

Genus ***Sathrophyllia*** Stål, 1874

158. *Sathrophyllia femorata* (Fabricius, 1787) : Karnataka.

159. *Sathrophyllia rugosa* (Linnaeus, 1758) : Karnataka.

SUMMARY

The paper presents the checklist of Orthoptera of Karnataka along with their known distribution only from the state, which includes 159 species/ subspecies of belonging to 111 genera representing 10 families.

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INSECTA : ORTHOPTERA : ACRIDOIDEA

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INTRODUCTION

Karnataka is a lower to high altitude hilly state in the south west India.. Notable workers like, Bolivar (1902, 1914), Kirby (1914), Uvarov (1921,1929), Henry (1940), Dirsh (1954,1961, 1975), Banerjee and Kevan (1960, 1964), Hollis (1971), Jago (1971), Ingrisch (1993) have taxonomically studied the group, but no body has yet worked out the fauna of Acridoidea of Karnataka state, except Mandal & Tirumalai (2009) have recorded a list of Acridoidea from this state.

Present paper is based on recent surveys in Karnataka by the scientists of Zoological Survey of India as well as previously published data. This report is as such the first consolidated report of the Superfamily Acridoidea from the state of Karnataka.

The present paper reports a total of 58 species distributed under 44 genera and 2 families, along with their systematic account, valid names, species diagnosis and zoogeographical distribution. Nineteen species are new from this state, these have been marked with an (*) in the text.

SYSTEMATIC ACCOUNT

CLASSIFIED LIST OF ACRIDOIDEA

Order ORTHOPTERA

Superfamily ACRIDOIDEA

Family PYRGOMORPHIDAE

1. *Atractomorpha crenulata* (Fabricius)
2. *Chrotogonus (Chr.) tr. trachypterus* (Blanchard)
3. *Chrotogonus (Chr.) oxy. oxypterus* (Blanchard)
4. *Ramakrishnaia gracilis* Kevan
5. *Ramakrishna notabilis* Bolivar
6. *Pyrgomorpha bispinosa bispinosa* (Walker)
7. *Pyrgomorpha conica* Bolivar
8. *Neorthacris acuticeps acuticeps* (Bolivar)
9. *Orthacris (Pseudoorthacris) rufocornis* Bolivar

Family ACRIDIDAE

Subfamily GOMPHOCERINAE

10. *Dnopherula (Aulacobothrus) luteipes* (Walker)
11. *Dnopherula (Aulacobothrus) desicus* (Walker)
12. *Leva indica* Bolivar
13. *Leva cruciata* Bolivar
14. *Bababuddinia bizonata* Bolivar
15. *Phonogaster carniventris* Henry
16. *Capulica alata* Uvarov

Subfamily ACRIDINAE

17. *Acrida exaltata* (Walker)
18. *Phlaeoba infumata* Brunner
19. *Phlaeoba antennata* Brunner
20. *Phlaeoba rotunda* Uvarov
21. *Gonista sagitta* (Uvarov)
22. *Gelastorrhinus semipictus* (Walker)
23. *Paraphlaeoba platyceps* Bolivar

Subfamily OEDIPODINAE

24. *Aiolopus thalassinus tamulus* (Fabricius)
25. *Heteropternis respondens* (Walker)
26. *Oedaleus abruptus* (Thunberg)
27. *Gastrimargus africanus* africanus (Saussure)
28. *Trilophidia annulata* (Thunberg)
29. *Acrotylus humbertianus* Saussure
30. *Morphacris citrina* (Walker)
31. *Dittopternis venusta* (Walker)

Subfamily ROMALINAE

32. *Teratodes monticollis* (Gray)

Subfamily HEMIACRIDINAE

33. *Spathosternum pr. prasiniferum* (Walker)
34. *Hieroglyphus banian* (Fabricius)
35. *Hieroglyphus nigrorepletus* Bolivar
36. *Gesonula punctifrons* (Stal)

Subfamily OXYINAE

37. *Oxya fuscovittata* (Marschall)
38. *Oxya hyla hyla* Serville
39. *Oxya nitidula* (Walker)
40. *Chitaura indica* Uvarov

Subfamily COPTACRIDINAE

41. *Coptacra punctoria* (Walker)
42. *Coptacra ensifera* Bolivar
43. *Eucoptacra saturata* (Walker)

Subfamily TROPIDOPOLINAE

44. *Oxyrrhepes obtusa* (de Haan)
45. *Tristria pulvinata* (Uvarov)

Subfamily EYPREPOCNEMIDINAE

46. *Eyprepocnemis al. alacris* (Serville)
47. *Heteracris pulchra* (Bolivar)
48. *Tylotropidius varicornis* (Walker)

Subfamily CATANTOPINAE

49. *Paraconophyma scabra* (Walker)
50. *Catantops pinguis innotabilis* (Walker)
51. *Catantops pulchellus* (Walker)
52. *Catantops henryi* Bolivar
53. *Xenocatantops humilis humilis* (Serville)
54. *Xenocatantops karnyi* (Kirby)
55. *Stenocatantops splendens* (Thunberg)

Subfamily CYRTACANTHACRIDINAE

56. *Pachyacris violascens* (Walker)
57. *Chondracris rosea* (de Geer)
58. *Cyrtacanthacris tatarica* (Linnaeus)

Superfamily ACRIDOIDEA

Size small to large, but range from less than 10mm to 65 mm.; antennae filiform, but some time ensiform; pronotum rarely cover a part of abdomen; wings either fully developed or reduced or absent; fore wings in the form of leathery tegmina; hind wings membranous, fan like; tympanal organ generally present; strong and well developed hind legs with enlarged femora which are adapted for jumping; all tarsi three segmented; claws provided with an arolium; structure of phallic complex entirely different and epiphallus present.

Key to families

1. Foveolae of vertex contiguous, superior and forming the extremity of the fastigium; stridulator mechanism absent ..... PYRGOMORPHIDAE

– Foveolae lateral or inferior, never forming the tip of fastigium; stridulatory mechanism present ..... ACRIDIDAE

Family PYRGOMORPHIDAE

Key to genus

1. Anterior margin of prosternum strongly reflexed and dialated . ***Chrotogonus*** Serville

– Anterior margin of prosternum neither reflexed nor dialated 2

2. Antennae remote from the eyes, placed in front of the ocelli 3

– Antennae near the eyes and inserted below the ocelli ..... ***Pyrggomorpha*** Serville

3. Brachypterus, or fully winged 4

– Tegmina rather absent 5

4. Tegmen reaches upto the first abdominal segment ..... ***Ramakrishnaia***

– Tegmen long and narrow and reaches beyond the abdomen ..... ***Atractomorpha***

5. Body rather uniformly slender and cylindrical; head longer than wide; tubercles of cheeks and lateral pronotal lobes few or lacking; tympanum variable, often small or lacking.. ..... ***Neorthacris*** Kevan

– Body varying from slender to stout; head variable, longer than wide; tubercles of cheek and lateral pronotal lobes numerous; tympanum always distinct .... ***Orthacris*** Bolivar

Genus ***Chrotogonus*** Serville, 1839

Key to species

1. Hind wings are clearly hyaline or occasionally faintly tinged yellowish brown but never infumated ..... ***trachypterus*** (Blanchard)

– Hind wings always infumated .... ***oxypterus*** (Blanchard)

Genus ***Atractomorpha*** Saussure, 1862

1. ***Atractomorpha crenulata*** (Fabricius)

1793. *Truxalis cre*nulata Fabricius, Ent. Syst., **2** : 28.

1969. *Atractomorpha crenulata*: Kevan and Chen, *Zool. J. Linn. Soc.*, **48** : 187.

Material examined : District : Mysore : 4♀♀, Manchali kere,12.ix.2008, coll. S.K. Mandal; 3♀♀, Gundappa, 13.ix.2008, coll. S.K. Mandal. Distict : Shimoga : 2♀♀, Shimoga, 23.ix.2008, coll. S.K. Mandal.

Diagnosis : Green or pale in colour; body medium and slender; fastigium of vertex short; eyes convex and prominent; lateral pronotal lobes with distinct membranous area, specially in females; hind femora not clearly convex; tegmina pointed, extending for one fourth of their length beyond the hind femora; hind wings normally tyrian pink to light mallow purple at base.

Distribution : India (Throughout).

Elsewhere : Bangladesh; Malaya: Myanmar; Pakistan; Sri Lanka; N. Sumatra; Thailand and S. Vietnam.

Remarks : It is a common species, generally found near the marshy land.

Genus ***Chrotogonus*** Serville, 1839

2. ***Chrotogous (Chr.) trachypterus trachypterus*** (Blanchard)

1836. *Ommexecha trachypterum* Blanchard, *Annls. Soc. ent. France*, **5** : 618.

1959. *Chrotogonus (Chr.) trachypterus trachypterus* : Kevan, *Publocoes cult. Co. Diam, Angola*, no. **43** : 147.

Material examined : District : Shimoga : 2♂♂, 3♀♀, Shimoga, 24.ix.2008, coll. S.K. Mandal.

Diagnosis : Body small in size; flattened; hind wings hyaline or occasionally faintly tinged yellowish brown, extend nearly two-thirds as long as tegmina.

Distribution : India (Karnataka, Andhra Pradesh, Bihar, Goa, Himachal Pradesh, Kerala, South east of Maharastra, South of Madhya Pradesh, Orissa, Tamil Nadu, Uttar Pradesh and West Bengal).

Elsewhere : Sri Lanaka.

Remarks : This species is the pest of various types of crops.

3. *Chrotogonus (Chr.) oxy. oxypterus* (Blanchard)

1836. *Ommexecha oxypterum* Blanchard, *Annls. Soc. ent. France*, **5** : 622.

1959. *Chrotogonus (Chrotogonus) oxypterus oxypterus* : Kevan, *Publsoes cult. Co. Diam. Angola*, no, **43** : 48.

Material examined : District : Shimoga : 5♀♀, Shimoga, 23.ix.2008, collc. S.K. Mandal.

Diagnosis : Body dorsoventrally flattened; hind wings infumated at basal part and extended nealy 2/3rd as long as tegmina.

Distribution : India (Karnataka, Andhra Pradesh, Bihar, Goa, Kerala, South-east of

Maharastra, Chattishgarh, Orissa, Tamil Nadu, Uttar Pradesh and West Bengal).

Remarks : It is a pest of various crops and vegetables and prefer the places where the amount of water is less in soil.

Genus ***Ramakrishnaia*** Bolivar, 1918

Key to species

1. Body slender fastigium vertices not narrow .....***notabilis*** Bolivarr

– Body more slender fastigium vertices narrower ..... ***gracilis*** Kevan

4. ***Ramakrishnaia gracilis*** Kevan

1964. *Ramakrishnaia gracilis* Kevan, *Can. Ent.*, **96** : 1501.

Material examined : Not available.

Diagnosis : Male : Head acutely conical, longer than pronotum; fastigium of vertex elongate, longer than wide; median carinula prominent; disc of pronotum a little longer than wide; disc of pronoum longer than wide, median carina distinct, lateral pronotal lobe longer than deep; mesonotum about as long as metazoan of pronotum; tegmina reduced, very narrow, strap like, slightly expanded posterior margin and reaching posterior margin of first abdominal segment; supra-anal plate narrowly elongate-triangular with a median longitudinal sulus; subgenital plate acute in dorsal view, subtruncate in lateral view; cerci short, compressed and broad at base. Female : head straight; dorsally in profile; fastigium of vertex with lateral margins divergence posteriorly; supra-anal plate and subgenital plate

5. ***Ramakrishnaia notabilis*** Bolivar

1918. *Ramakrishnaia notabilis* Bolivar, *Rev. Acad. Cien. exact. fisi. nat. Madrid*, **16** : 392.

1964. *Ramakrishnaia notabilis* Kevan, *Can. Ent.*, **96** : 1500.

Material examined : not available.

Diagnosis : Body more or less slender with a little narrow fastigium vertices and oblique frontal profile; head longer than pronotum; in male epiproct more or less elongate and an acute subgenital plate in dorsal view; in female with slender ovipositor valves.

Distribution : India (Karnataka).

Remarks : It is taken from the literature (Kevan, 1964).

Genus ***Pyrgomorpha*** Serville, 1831

Key to species

1. Lateral carinae of pronotum well marked .... ***conica*** (Olivar)

– Lateral carina of pronotum broken ....***bispinosa bispinosa*** (Walker)

6. ***Prgomorpha bisinosa bispinosa*** (Walker)

1870. *Pyrgomorpha bispinosa* Walker, *Cat. Derm. Salt. Brit. Mus.*, **3** : 499.

1975. *Pyrgomorpha bispinosa bispinosa* : Kevan, *Acrida*, **4** : 58.

Material examined : District : Mysore : 1♀, Rajiv Gandhi National park, 14.ix.2008, collc. S.K. Mandal.

Diagnosis : Body medium size and moderately slender; pronotum with lateral carinae broken; tegmina in some cases even in female, extend beyond the abdomen; posterior ventral point of lateral pronotal lobe distinct but generally short.

Distribution : India (Karnataka, Andhra Pradesh,Orissa, Tamil Nadu).

Remarks : It is recorded first time from Karnataka.

7. ***Pyrgomorpha conica*** (Olivier)

1791. *Acridium conicum* Olivier, *Encycl. Meth. Ins.*, **6** : 230.

1914. *Pyrgomorpha conica* : Kirby, *Fauna Brit. India, Orthoptera* : 175.

Material examined : Not available.

Diagnosis : Lateral carinae of pronotum well marked; wings hyaline, generally pink towards the base along nervures; hind tibiae above with an outer apical spine; abdomen spotted with black above.

Distribution : India (Karnataka, Andhra Pradesh, Rajasthan, West Bengal).

Elsewhere : N.W. Africa, W. Asia; S.Europe.

Remarks : This species is rather in limited distribution. It is reported from literature (Mandal, 2007).

Genus ***Neorthacris*** Kevan, 1964

8. ***Neorthacris acuticeps acuticeps*** (Bolivar)*

1902. *Orthacris acuticeps* Bolivar, *Ann. Soc. ent. France*, **70** : 608, 610.

1964. *Neorthacris acuticeps acuticeps* : Kevan & Singh, *Entomologist*, **97** : 175.

Material examined : District : Codagu : 1,♀, Talkavery wls, 17.ix.2008, collc. S.K. Mandal.

Diagnosis : Body elongate, side of the body with a distinct broad black (some time dark green) band bordered both above and below by much narrower yellow stripes runs uniformly and unbroken; male cerci as long as but not sufficiently longer than supra anal plate; female supra anal plate longer than its width.

Distribution : India (Karnataka, Andhra Pradesh, Kerala, Tamil Nadu).

Remarks : This species is first time recorded from Karnataka state.

Genus ***Orthacris (Pseudorthacris)*** Kevan and Singh

9. ***Orthacris (Pseudorthacris) rufocornis*** Bolivar*

1902. *Orthacris rufocornis* Bolivar, *Ann. Soc. ent. France*, **70** : 580.

1964. *Orthacris (Pseudorthacris) rufocornis* : Kevan and Singh, *Trans. R. Entom. Soc. London*, **117**(13) : 367.

Material examined : District : Codagu : 1♂, Talkavery wild life sanctuary, 17.ix.2008, collc S.K. Mandal.

Diagnosis : Size medium; body robust; antennae long, with 14 segments, segments quadrate; fastigium of vertex semi-circurcular in front, longer than wide; sides of head and pronotum with a few tubercles; tympanum large; a furrow on supra-anal plate of male; hind femora narrow.

Distribution : India (Karnataka, Kerala and Tamil Nadu).

Remarks : This species is newly recorded from Karnataka state.

Family ACRIDIDAE

Key to the subfamily

1. Prosternal tubercle usually absent; if present, then antennae ensiform and body strongly elongate 2
– Prosternal tubercle present 4
2. Sound producing mechanism represented by articulated stridulatory pegs on inner side of hind femur ..... GOMPHOCERINAE
– Sound producing mechanism not represented by peg on inner side of hind femur 3
3. Head with acute in profile, and with acute angle of frons; tegmina without intercalary vein (if present, weak, irregular and not serrated even in male) ..... ACRIDINAE
– Head rounded in profile, face almost vertical, rarely oblique and tegmina always with an intercalary vein in median area (mostly well developed) ..... OEDIPODINAE
4. Lower basal lobe of hind femur as long as upper one or insignificantly longer or shorter ..... ROMALEINAE
– Lower basal lobe of hind femur distinctly shorter than upper one 5
5. Radial area of tegmen with a series of regular parallel stridulatory veinlets .... HEMIACRIDINAE
– Stridulatory veinlets of radial area of tegmen absent; if apterous, then tympanum (at least rudimentary) present 6
6. Lower external lobe of hind knee with spine-like apex ..... OXYINAE
– Lower external lobe of hind knee with apex rounded, angular or subacute but not spine like 7

7. Last abdominal tergite in male (in most of the genera) well developed furcula; supra anal plate mostly with an attenuate or trilobate apex ..... COPTACRIDINAE

– Last abdominal tergite without well developed furcula; supraanal plate. Variable; subgenital plate without transverse fold 8

8. Mesosternal interspace closed .... TROPIDOPOLINAE

– Mesosternal space mostly open 9

9. Mesosternal lobes rounded or obtuse-angular or acute-angular, but not rectangular 10

– Mesosternal lobes rectangular .... CYRTACANTHACRIDINAE

10. Dorsum of pronotum flat or weekly tectiform, with median and lateral carinae linear (linear carinae sometimes obliterated); male cercus with strongly compressed, lobiform or subacute, down curved at apex .... EYPREPOCNEMIDINAE

– Dorsum of pronotum of variable shape; lateral carinae if present, not linear; male cercus variable, but not with strongly compressed, lobiform or subacute, down curved at apex .....CATANTOPINAE

Subfamily GOMPHOCERINAE

Key to Genera

1. Body long slender; head broad, lamellated, longer than pronotum; head and pronotum with numerous parallel carinae; wings abbreviated ..... ***Phonogaster*** Henry

– Body not long and slender; head not broad and lamellated; head and pronotum without parallel carinae; wings well developed 2

2. Antennae flattened towards basal segment; prozona longer than metazona ....***Bababuddinia*** Bolivar

– Antennae filiform; prozona not longer than metazona 3

3. Fastigial foveolae of vertex not visible from above, apex more or less angular .... ***Leva*** Bolivar

– Fastigial foveolae of vertex visible from above, apex not pointed .....***Dnopherula*** Karsch

Genus ***Dnopherula*** Karsch, 1896

Subgenus ***Aulacobothrus*** Bolivar, 1902

10. ***Dnopherula (Aulacobothrus) luteipes*** (Walker)

1871. *Stenobothrus luteipes* Walker, *Cat. Derm. Salt. Brit. Mus.*, **5** Suppl. : 82.

1971. *Dnopherula (Aulacobothrus) luteipes* : Jago, *Proc. Acad. Sci. Philad.*, **123**(8) : 243

Material examined : District : Dakhin Kanada : 1♀, Bhatkal,20.ii.2010, collc. S.K. Mandal. District : Mysore : 2♀♀, Manchalikere, 12.ix.2008, collc. S.K. Mandal. 6♀♀,Rajiv Gandhi national park,13.ix.2008, collc. S.K. Mandal. District : Shimoga : 3♀♀,Haihole, Settihali wls, 15.ii.2010, collc. S.K. Mandal. 6♂♂, 11♀♀, Saravati wls, 16&17.ii. 2010,collc. S.K. Mandal.

Diagnosis: Size small; hind femur with three black bands on the dorsal surface and with a black at the distal end; pronotum subcylindrical with nearly parallel lateral carinae which are weakly concave in the middle part; posterior part of pronotum nearly smooth and posterior margin obtusely angulate; median carina distinct; hind tibiae reddish in the apical part.

Distribution : India (Karnataka, Assam, Bihar, Delhi, Himachal Pradesh, Jammu and Kashmir, Madhya Pradesh, Maharastra, Orissa, Tamil Nadu, West Bengal).

Elsewhere : N. America; China; Europe; Japan; Myanmar and Sri Lanka.

Remarks : Widely distributed in India.

11. ***Dnopherula (Aulacobothrus) descisus*** (Walker)

1871. *Stenobothrus decisus* Walker, *Cat. Derm. Salt. Br. Mus.*, **5** : 80.

1971. *Dnopherula (Aulacobothrus) decisus* : Jago, *Proc. Acad. Sci. nat. Philad.*, **123**(8) : 24.

Material examined : District : Shimoga : 3♂♂, 3♀♀, Shettihali wls, 15. ii. 2010, collc. S.K. Mandal. 1♀, Saravati wls, Joga, 17.ii.2010, collc. S.K. Mandal.

Diagnosis : Size small; general colour brownish; fastigium of vertex almost subtraingular; abdomen carinated above; a pale stripe usually running from fastigium to end of pronotum; tegmen rufo testaceous; tibiae with small black spines on each side.

Distribution: India (Karnataka, Andhra Pradesh, Arunachal Pradesh, Kerala, Maharastra, West Bengal).

Remarks : We have found this species from two localities of Shimoga district.

Genus ***Leva*** Bolivar, 1909

12. ***Leva indica*** (Walker)

1909. *Gymnobothrus indicus* Bolivar, *Bol. Soc. esp. Hist. nat.*, 9 : 295.

1921. *Leva indica* : Uvarov, *Ann. nat. Hist.*, *7*(9) : 485.

Material examined : District : Mysore : 1♂, Rajiv Gandhi national park, 12.ii. ix. 2008, collc. S.K. Mandal. 4♂♂, 2♀♀, Gundappa, 13, ix.2008, collc. S.K. Mandal.

Diagnosis : Size small; antennae filiform, basal segments slightly depressed; fastigium of vertex long, angular with acute apex; foveolae not visible from above; lateral carinae of pronotum parallel in prozona and divergent in metazoan; median carina cut by 3rd sulcus in metazoan.

Distribution : India (Karnataka, Bihar, Delhi, Kerala, Orissa, Tamil Nadu, Tripura and West Bengal).

Elsewhere : Sri Lanka.

Remarks : This species occurs in associated with *Leva cruciata.*

13. ***Leva cruciata*** Bolivar

1914. *Leva cruciata* Bolivar, *Trab, Mus. Cienc. nat. Madrid*, **20** : 66.

1929. *Leva cruciata* : Uvarov, *Revue suisse Zool.*, **36** : 450.

Material examined : District : Mysore : 4♂♂, 6♀♀,Gundappa, Rajiv Gandhi national park, 13.ix.2008, collc. S.K. Mandal.

Diagnosis : Size small; antennae filiform, basal segments slightly depressed; fastigium of vertex long, angular with acute apex, foveole not visible above; Dorsum of pronotum constricted, lateral carinae of pronotum excurved in prozona and in metazoan to form 'X' shaped marking.

Distribution : India (Karnataka, Andhra Pradesh, Bihar, Orissa, Tamil Nadu, Tripura, West Bengal).

Elsewhere : Sri Lanka.

Remarks : This species is fairly distributed in Karnataka.

14. ***Bababuddinia bizonata*** Bolivar

1917. *Bababuddinia bizonata* Bolivar, *Revta R. Acad. Cienc. Exact fis. Nat. Madrid*, **16**: 382.

1919. *Bababuddinia bizonata* : *Revue Suisse Zool.*, **36** : 544.

Material examined : Not available.

Diagnosis : Male : Size medium; head conical, fastigium of vertex longer than its width, convex, with transverse basal furrow and sharp marginal carinulae; fastigial foveolae hardly visible from above; antennae flattened towards basal se4gments; disc of pronotum flattened, crossed by single sulcus behind the middle of pronotum; elytra and wings fully developed and slightly extended beyond the hind femora; supr-anal plate triangular, acute at apex, cerci longer than the supra-anal plate, obtusely rounded at apex; subgenital plate acute at apex.

Distribution : India (Karnataka, Kerala and Tamil Nadu.)

Remarks : This species is taken from the literature (Uvarov, 1919).

Genus ***Phonogaster*** Henry, 1940

15. ***Phonogaster cariniventris*** Henry*

1940. *Phonogaster cariniventris* Henry, *Trans. R. ent. Soc. London,* **90**(19) : 510.

Material examined : 2♂♂,1♀, Sadashivgarh, Karwar, 4.iv.1984, collc. M.S. Shishodia.

Diagnosis : Body long and slender; head elongate, much longer than pronotum, dorsum of head and pronotum with a strong median carina and seven lateral parallel carinae starting from behind the eye; fastigium of vertex longer than eye; tegmina and wings extended behind the hind knee and posteriorly acutely pointed; in male supra-anal plate triangular and acutely blunt posteriorly; ceri cylindrical, tapering; in female supra-anal plate triangular, compressed; cerci short conical.

Distribution : (Karnataka, Tamil Nadu).

Remarks : This species is endemic to India.

Genus ***Capulica*** Bolivar, 1917

16. ***Capulica alata*** Uvarov

Capulica alata Uvarov, *Revue Suisse Zool.*, **36** : 540.

Material examined : Not available.

Diagnosis : Not available.

Distribution : India (Karnataka).

Remarks : This species is taken from (Uvarov, 1929).

Subfamily ACRIDINAE

Key to genera

Genus ***Acrida*** Linnaeus, 1758

Key to genera

1. Fastigium of vertex horizontally produced, and forming an angle with the frontal ridge 2
– Fastigium of vertex rounded in front, which is nearly vertical 3
2. Head large, tegmina longer than abdomen 4
– Head small; its length considerably shorter than pronotum ..... ***Gonista*** Bolivar
3. Head length with considerably greater than the pronotum; eyes situated on the anterior part of the head ..... ***Acrida*** Linaeus
– Head length with equal to less than or some what greater than that of pronotum; eyes situated nearly in the middle part of the head ..... ***Gelastorhinnus*** Brunner
4. Tegmen rudimentary; wings not developed; apex of tegmina not Obliquely truncate .... ***Paraphlaeoba*** Bolivar
– Tegmen and wings perfectly developed; apex of tegmina obliquely truncate .... ***Phlaeoba*** Brunner

17. ***Acrida exaltata*** (Walker)

1859. *Truxalis exaltata* Walker, *Ann. Mag. nat. Hist.*, (3)**4** : 222.

1954. *Acrida exaltata* : Dirsh, *Bull. Soc. Fouad Ent.*, **38** : 149.

Material examined : District : Mysore : 5♂♂ 6♀♀, Manchalikere, 12.ix. 2008, collc. S.K. Mandal. District : Shimago : 4♂♂,6♀♀,Shimago, 23.ix.2008, collc. S.K. Mandal.

Diagnosis : Size medium large size; head conically ascending, basal part narrow, fastigium of vertex broad, laminate and truncate; transverse sulcus of pronotum placed about the middle of disc; hind femora without any peg-like structure on internal surface.

Distribution : India (Karnataka, widely distributed).

Elsewhere : Afghanistan; Aden; Arabia; Bangladesh; S.E. Iran; Nepal; Pakistan; Sri Lanka; S.E. Tibet and Yemen.

Remarks : This species is widely distributed throughout plains and hilly regions of Indian sub-continent.

Genus ***Phlaeoba*** Stal, 1860

Key to genera

1. Antennae unicolour ..... *infumata* Brunner
– Antennae ringed or tipped with obscure yellow ..... *antennata* Brunner

18. ***Phlaeoba infumata*** Brunner

1893. *Phlaeoba infumata* Brunner, *Annali Mus. civ. Stor. Nat. Giacomo Doria*, **33** : 124.

1914. *Phlaeoba infumata* : Kirby, *Fauna Brit. India, Orthopt.*, : 103.

Material examined : District : Chikmagalur : 1♂, 2♀♀ Muthodi, Bhadra wls, 21.ix.2008, collc. S.K. Mandal.3♂♂,2♀♀, Emrally village, Muthodi, 21.ix. collc. S.K. Mandal. District : Mysore : 2♂♂, Gundappa, 13.ix.2008, collc. S.K. Mandal. District : Shimoga : 3♂♂,4♀♀, Rajiv Gandhi National park, 12.ix.2008,collc.S.K.Mandal. 10♂♂, 3♀♀, Haihole, Settihali wls,14,15 and 16.ii.2010, collc. S.K. Mandal.

Diagnosis : Size medium; brownish testaceous in colour; antennae ensiform; tegmina and wings longer than abdomen; wings fusco-hyaline, infuscated towards extremity and subgenital plate of male acute at apex.

Distribution : India (Karnataka, Widely distributed).

Elsewhere : S. China; Malacca; Myanmar; E. Nepal.

19. ***Phlaeoba antennata*** Brunner,

1893. *Phlaeoba antennata* Brunner, *Annali. Mus. civ. Stor. nat. Giacomo. Doria.*, **13** : 125.

1914. *Phlaeoba antennata* : Kirby, *Faun. Brit. India, Orthoptera, Acrididae,* : 102.

Material examined : District : Chikmagalur : 5♂♂, 6♀♀, Emrally village, Muthodi, Bhadra wls, 20 & 21.ix.2008, collc S.K. Mandal. Distict : Codagu : 1♂, around source of Kavery river, 16.ix.2008, collc. S.K. Mandal. District : Mysore : 1♂, Manchalikere, Rajiv Gandhi national park, 12.ix.2008, collc. S.K. Mandal. District : Shimago : 2♀♀, Haihole, Settihali, 15.ii.2010, collc. S.K. Mandal; 1♀, Gundappa, 13.ix.2008, collc. S.K. Mandal.

Diagnosis : Medium in size; olive-brown colour with a broad band running from the vertex to the end of tegmina, at least in male; antennae ensiform, black, tipped with yellow; pronotum smooth, all the three carinae well marked; wings bluish black at base, infuscated towards the tip; posterior tibiae dirty blue.

Distribution : India (Karnataka, Arunachal Pradesh, Assam, Kerala, Orissa, Rajasthan, West Bengal).

Elsewhere : Bangladesh; Borneo; Myanmar; China; Hainan; Malaya; Tonking; Sumatra.

Remarks : This species is well distributed in India. It is known to occur both in plains and hilly regions mainly in forest areas.

20. ***Phlaeoba rotundata*** Uvarov

1929. *Phlaeoba rotundata* Uvarov, *Revue Suisse Zool.*, **36** : 537.

Material examined : Not available.

Distribution : India (Karnataka [Mysore], Tamil Nadu).

Remarks : This species is taken from the literature (Bhowmik, 1985).

21. ***Gonista sagitta*** (Uvarov)

1912. *Gelastorrhinus sagitta* Uvarov, *Horae. Soc. Ent. Ross.*, **11**(3) : 10.

1913. *Gelastorrhinus semipictus* : Kirby, *Fauna British India,* **1** : 217.

1933. *Gonista sagitta* : Uvarov, *Trans. Inst. Zool. Acad. Sci.,* URSS, **1** : 189.

Material examined : Not available.

Diagnosis : Body long and slender; head small, much shorter than pronotum; vertex in both sexes distinctly narrowed towards the fastigium, its inner carinae converging towards the fastigium; antennae sword-shaped; length of tegmina 10-11 times more than their greatest width; wings 2.5-2.75 times more than its greatest width, shorter than tegmina; female mesosternum in the median part with distinctly separated lobes.

Distribution : India (Karnataka, Manipur, Sikkim, Tamil Nadu).

Elsewhere : North Afghanistan; Azerbaijan; Myanmar; Sri Lanka.

Remarks : This species is reported from (Tandon and Shishodia, 2004). It is commonly known as arrow grasshopper.

Genus ***Gelastorrhinus*** Brunner, 1893

22. ***Gelastorrhinus semipictus*** (Walker)*

1870. *Opomala semipicta* Walker, *Cat. Derm. Salt. Brit. Mus.*, **3** : 512.

1914. *Gelastorrhinus semipictus* : Kirby, *Fauna Brit. India,* Orthoptera, Acrididae, 1: 217.

Material examined : District : Shimoga : 1♀, Saravati wls, 17.ii.2010, collc. S. K. Mandal

Diagnosis : Body long, slender; fastigium is separated from vertex by an arched sulcus; antennae thickened and flattened at base, and as long as head and pronotum; tegmina is not uniformly green.

Distribution : India (Karnataka, Andra Pradesh, Tamil Nadu).

Elsewhere ; Sri Lanka.

Remarks : This species is rare in collection. We have found one female from single locality. It is first time recorded from Karnataka.

Genus *Paraphlaeoba* Bolivar, 1902

23. *Paraphlaeoba platyceps* Bolivar*

1902. *Paraphlaeoba platyceps* Bolivar, *Anns. Soc. ent. France*, **70** : 593.

1929. *Paraphlaeoba platyceps* Uvarov, *Rev. suisse Zool.,* **36** : 538.

Material examined : District : Chikmagalur : 6♂♂,Emrally village, Bhadra wls, 21.ix.2008, collc. S.K. Mandal. District : Mysore : 2♂♂, Manchallikere, 12.ix.2008, collc. S.K. Mandal.

Diagnosis : Size small; antennae 24 segments; seven basal segments of flagellum depressed, of which 4 segments more or less ensiform, apical segment pointed; frontal ridge compressed above median ocellus; pronotum with disc crossed by 2 transverse sulci; first sulcus indented on lateral lobes only; metazona less than half of the prozona; tegmina lobate and pointed at apex ; supra-anal plate triangular with a median transverse suture; cerci conical as long as supra-anal plate; subgenital plate navicular.

Distribution : India (Karnataka, Andhra Pradesh, Kerala, Tamil Nadu).

Remarks : This species is newly recorded from Karnataka state.

Subfamily OEDIPODINAE

Key to genera

1. Median carina of pronotum entire or slightly intersected by the transverse groove. (foeolae trapezoidal) ..... ***Aiolopus*** Fieber
– Median carina of pronotum very distinctly interrupted by transverse groove 2
2. Median carina of pronotumcut by two grooves 3
– Median carina of pronotum cut by two grooves 6
3. Thorax rather short 4
– Thorax long 5
4. Wings without well-marked fascia 7
– Wings with well marked fascia .... ***Oedaleus*** Fieber
5. Pronotum with strong crest or acutely tectiform without black Black mark at apex .... ***Gastrimargus*** Saussure
– Pronotum with well-marked median carina, and with numerous longitudinal rugue .... ***Morphacris*** Walker
4. Pronotum with well-marked crest, angulated behind; median carina of pronotum distinctly interrupted in the prozona by transverse grooves and seems to be bidentate; occiput with a pair of tubercles between the eyes; wings without dark ..... ***Trilophidia*** Stal
– Pronotum without distinct crest; median carina indistinctly interrupted by the transverse grooves, not bidentate in prozona; occiput without a pair of tubercles between the eyes; wings with dark band in the middle .... ***Acrotylus*** Fieber
5. Internal calcaria of posterior tibiae not greatly unequal, normal ..... ***Dittopternis*** Sauussure
– Internal calcaria of posterior tibiae unequal, the lower one much longer than the upper, apex acute and abruptly hooked .... ***Heteropternis*** Stal

Genus ***Aiolopus*** Fieber, 1853

24. ***Aiolopus thalassinus tamulus*** (Fabricius)

1798. *Gryllus tamulus* Fabricius, *Ent. Syst., Suppl.* : 195.

1968. *Aiolopus thalassinus tamulus* : Hollis, *Bull. Brit. Mus. nat. Hist. (Ent.)*, **22**(7) : 347.

Material examined : District Bangalore : 1 ♂, Kenengi, 8.ii.2010, collc. S.K. Mandal. District : Codagu : 2♂♂, 5♀♀, Around Tal Cavery wild life sanctuary, 16, 17 and 18ix.2008, collc. S.K. Mandal. District : Shimoga : 6♂♂, 8♀♀, Settihali wls, 13 and 14.ii.2010, collc. S.K. Mandal; 2♀♀, Saravati wls, Joga, 17.ii.2010, collc. S.K. Mandal.

Diagnosis : Size medium; fastigium with front angle more acute; foveolae narrowly trapezoid, about as long as wide; pronotum somewhat saddle-shaped, posterior margin rounded; posterior tibiae usually with red colouration in apical fourth and broadly separated from black band by a wide bluish grey band.

Distribution : India (Karnataka, Andaman & Nicobar Islands, Bihar, Delhi, Himachal Pradesh, Madhya Pradesh, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal).

Elsewhere : Australia; Bangladesh; Borneo; Celebes; China; Hainan; Hong Kong; Japan; Java; Lombok; Malaya; Myanmar; New Guines; Papua; Philippines; Singapore; Sri Lanka; Sumatra; Taiwan; Thailand and Timor.

Remarks : This species is recorded throughout Oriental region and extends upto Australia.

Genus ***Heteropternis*** Stal, 1873

25. ***Heteropternis respondens*** (Walker)

1859. *Acrydium respondens* Walker, *Ann. Mag. nat. Hist.*, *4*(3): 223.

1912. *Heteropternis respondens* : Kirby, *Faun. Brit. India, Orthoptera* : 141.

Material examined : District : Not available, B. Ghatta, 24.v.1985, collc. M. Prasad.

Diagnosis : Body medium in size; head smooth or a little granulated; hind margin of pronotum rectangular, rounded at apex; basal half of tegmina opaque, transverse veins in apical part erect, the cells square or oblong; wings without well marked fascia; hind tibiae red, unequal internal spines, wings yellow at base and darker towards out side.

Distribution : India (Karnataka, Arunachal Pradesh, Bihar, Himachal Pradesh, Orissa, Tamil Nadu and Uttar Pradesh); China; Java; Myanmar; Malakka; South East Asia; Sri Lanka and Sumatra.

Remarks : From literature Tandon and Shishodia (1995).

Genus ***Oedaleus*** Fieber, 1853

26. ***Oedaleus abruptus*** (Thunberg)

1815. *Gryllus abruptus* Thunberg, *Mem. Acad. Sci, St.-Petersb.*, **5** : 233.

1981. *Oedaleus abruptus* : Ritchie, *Bull. Brit. Mus. nat. Hist. (Ent)*, **42**(3) : 104-107.

Material examined : Shimoga : 4♀♀, Shimoga, 23.ix.2008, collc. S.K. Mandal.

Diagnosis : Size medium; pronotum low tectiform, median carina low acute, not interrupted by posterior sulcus; hind margin obtusely angular; pronotal x marking always with anterior and posterior arms separate; hind tibiae with straw or red coloured with dark basal ring and thicker sub-basal pale ring.

Distribution : India (Karnataka, Bihar, Goa, Jammu & Kashmir, Goa, Kerala, Madhaya Pradesh, Meghalaya, Orissa, Rajasthan; Tamil Nadu, Uttar Pradesh and West Bengal).

Elsewhere : Afghanisthan; Bangladesh; China; Indo-Chaina; Myanmar; Nepal Pakistan; Sri Lanka and Thailand.

Remarks : This species is widely distributed in India

Genus ***Gastrimargus*** Saussure, 1884

27. ***Gastrimargus africanus africanus*** (Saussure)

1888. *Oedaleus (Gastrimargus) marmoratus var. africana* Saussure, *Mem. Soc. Phys. Hist. nat. Geneve*, **30**(1) : 39.

1982. *Gastrimargus africanus africanus* : Ritchie, *Bull. Brit. Mus. nat. Hist. (Ent.)*, **44**(4) : 248.

Material examined : District : Mysore : 1♀, Gundappa, 13.ix.2008, collc. S.K. Mandal. District : Shimoga : 1♀, Shimoga, 23.ix.2008, collc. S.K. Mandal; 1♂, Haihole, Shettihali wls, 15.ii.2010, collc. S.K. Mandal; 1♂, Saravati Wls, Joga, 17.ii.2010, collc. S.K. Mandal.

Diagnosis : Body large size; antennae as long as head and pronotum together or slightly longer; pronotum tectiform with high sharp median carina; metazoan of pronotum with X-marking usually effaced and without pale striae; wings with dark brown or black fasciae hind femora brown or blackish.

Distribution : India (Karnataka, Andhra Pradesh, Bihar, Chattrish garh, Delhi, Goa, Himachal Pradesh, Orissa, Sikkim, Tamil Nadu, Uttar Pradesh, Uttaranchal,West Bengal).

Elsewhere : Nepal; Saudi Arabia; Sri Lanka; Thailand; Tibet and Yemen A. R.

Remarks : In general it occurs all over from Peninsular India to the north of Himalayas.

Genus ***Trilophidia*** Stal, 1873

28. ***Trilophidia annulata*** (Thunber

1815. *Gryllus annulatus* Thunberg, *Mem. Acad. Sci. St. Petersb.*, **5** : 234.

1965. *Trilophidia annulata* : Hollis, *Trans. R. ent. Soc. London*, **117**(8) : 251.

Material examined : District : Bangalore :1♂, Vortoor, 8.ii.2010, collc. S.K. Mandal. District : Codagu : 2♀♀, East of forest Bunglow, Chikmagalur, 16.ix.2008, collc. S.K. Mandal; 2♂♂, Bagmandella, 17.ix.2008, collc. S.K. Mandal. District : Mysore : 2♂♂,4♀♀, Elephant camp, Rajiv Gandhi national park, 12.ix.2008, collc. S.K. Mandal; 1♀, Gundappa, 13.ix.2008, collc. S.K. Mandal; 2♂♂, 5♀♀, Manchalikere, Rajiv Gandhi National park, 15.ix.2008, collc. S.K. Mandal. District : Shimoga : 1♀, Shimoga, 23.ix.2008, collc. S.K. Mandal; 5♂♂, 1♀Mahatma Gandhi power project, 25.ix.2008, collc. S.K. Mandal; 1♂, Settihali wls, 13.ii.2010, collc. S.K. Mandal; 2♂♂, 3♀♀, Haihole, 14.ii. 2010, collc. S.K. Mandal.

Diagnosis : Size medium; body brown to grey with black markings, pubescent beneath; pronotum rugose with a high median carina, forming two teeth in front, and with lateral carina; wings yellow at base and brown or black beyond; hind tibiae brown with a pale band towards the base and with a little pale band beyond the middle.

Distribution : India (Karnataka, Andhra Pradesh, Bihar, Goa; Madhya Pradesh, Orissa, Sikkim, Tamil Nadu, Uttar Pradesh and West Bengal).

Elsewhere : Afghanistan; Bangladesh; Borneo; South Chaina; Japan; Java; Korea; Malayasia; Mongolia; Myanmar; Nepal; Pakistan; Philippines Sarawak; Singapore; Sri Lanka; Sumatra; Taiwan; Thailand; Vietnam.

Remarks : This species is widely distributed in India and its range of *Distribution* extends from Pakistan to North Borneo and extends into Palaearctic region. It is a bare ground species.

Genus ***Acrotylus*** Fieber, 1853

29. ***Acrotylus humbertianus*** Saussure*

1884. *Acrotylus humbertianus* Saussure, *Mem. Soc. Phys. Hist. nat. Geneve*, **28**(9) : 189.

1914. *Acrotylus humbertianus* : Kirby, *Fauna Brit. India, Orthoptera* : 153.

Material examined : District : Shimoga : 1♂, Saravati wls,16.ii.2010, collc. S.K. Mandal.

Diagnosis : Body medium in size; antennae longer than head and pronotum together; tip of vertex conical, concave, with a carina on each side; prozona with fuscus fascia, lateral margin white below; tegmina with two oblique white spots or fascia; wings hyaline, yellow at base; radial area with a semilumnar fuscous fascia.

Distribution : India (Karnataka, Andhra Pradesh, Assam, Delhi, Goa, Himachal Pradesh, Madhya, Pradesh, Maharastra, Rajasthan, Tamil Nadu and West Bengal).

Elsewhere : Afghanistan; Bangladesh; Nepal; Pakistan; Sri Lanka.

Remarks : It seems to be rare in Karnataka, as we have found one example in Shimoga district.

Genus ***Morphacris*** Walker, 1870

30. ***Morphacris citrina*** Kirby*

1815. *Gryllus fasciatus* Thunberg, *Mem. Acad. Sci. St., Petersb.*, **5** : 230.

1921. *Morphacrs citrina*: Kirby, Fauna of British India, Orthoptera (Acrididae) : 137.

Material examined : District : Mysore : 1♀, Rajib Gandhi national park. District : Shimoga : 4♂♂, Saravati wls, 16.ii.2010, collc. S.K. Mandal.

Diagnosis : Size medium; antennae filiform, longer than head and pronotum together; pronotum tectiform, without lateral carinae; median carina sharp and high; dorsum covered with parallel sharp longitudinal ridges; wings at base light yellowish with dark transverse fascia.

Distribution : India (Karnataka, Andhra Pradesh, Bihar, Goa, Kerala, Madhya Pradesh, Maharastra, Tamil Nadu).

Elsewhere : Ethiopia; Sri Lanka; Syria.

Remarks : It is widely distributed in India.

Genus ***Dittopternis*** Saussure, 1884

31. ***Dittopternis venusta*** (Walker)*

1870. *Oedipoda venusta* Walker, *Cat. Derm. Salt. Br. Mus.*, 4: 740.

1913. *Dittopternis venusta* : Kirby, *Fauna British India*, (Orthopt) Acrididae : 140.

Material examined : District : Mysore :1♂,Manchalikere,12.ix.2008, collc. S.K. Mandal. District Shimoga :1♀, Manchalikere, 12.ix.2008, collc. S.K. Mandal; 1♂,2♀♀, Shimoga, 23.ix.2008, collc. S.K. Mandal. Mahatma Gandhi power project, 25.ix.2008, collc. S.K. Mandal.

Diagnosis : Size small; deep brown in colour; pale beneath; vertex with four diverging rows; pronotum rugose, granulated and strongly carinated, cut by principal sulcus before the middle, obtusely angulated behind, with tip rounded; wings hyaline, yellow at base, with broad suffused blackish band beyond; hind tibiae black at base, followed by a light yellow band, then blue.

Distribution : India (Karnataka, Madhya Pradesh, Orissa, Tamil Nadu).

Elsewhere : Sri Lanka.

Remarks : *Dittopternis venusta* is fairly distributed in India.

Subfamily ROMALEINAE

Genus ***Teratodes*** Brulle,

32. ***Teratodes monticollis*** (Gray)*

1832. *Gryllus monticollis* Gray, *Griffith's Anim. Kingdom*, **5** : 215.

1914. *Teratodes monticollis* : Kirby, *Fauna Brit. India, Orthoptera* : 235.

Material examined : 1♂, Shettihali wls, 13.ix.2010, collc. S.K. Mandal.

Diagnosis : Body stout; head broad, rounded, face vertical; antennae short and filiform; pronotum raised, large sub-laminate, compressed, the front arched above the head in a point, the middle forming a high crest, denticulated, specially behind, and covering half of the length of abdomen; legs short, tegmina opaque.

Distribution : India (Karnataka, Andhra Pradesh, Kerala, Madhya Pradesh, Maharastra, Tamil Nadu).

Elsewhere : Sri Lanka.

Remarks : Usually found on trees or large woody, shrubs in forest areas. This species is newly recorded from this state.

Subfamily HEMIACRIDINAE

Key to subfamily

1. Prosternal tubercle spathulate; head conical; fastigium of vertex obtusely angular; tegmina with a pach of densely placed transverse nervures at the parting of the radial vein .... SPATHOSTERNUM Karsch

– Prosternal process not spathulate; head not conical; fastigium of vertex not angular;

tegmina without a patch of nervures at the parting of the radial veins 2

2. Size small; head small; fastigium longer at apex, obtusely triangular .... GESONULA Uvarov

– Size medium; head big; fastigium of vertex not triangular at apex .... HIEROGLYPHUS Krauss

Genus ***Spathosternum*** Krauss, 1877

33. ***Spathosternum pr. prasiniferum*** (Walker)

1871. *Heteracris (?) prasinifera* Walker, *Cat. Derm. Salt. Brit. Mus.*, **5** Suppl.: 65.

1936. *Spathosternum prasiniferum prasiniferum* : Tinkham, *Lingman. Sci. Journ. Canton*, **15** : 51.

Material examined : District : Chikmagalur : 1♂,1♀,Mutuhali,Bhadra wild life sanctuary, 20.ix.2008, collc. S.K. Mandal; 6♂♂, 11♀♀, Emralli village, Muthodi, Bhadra W.L.S, 21.ix.2008, collc. S.K. Mandal. District : Kodagu : 2♂♂, 5♀♀, Talkavery WLS, 17.ix.2008. District : Mysore : 5♂♂, Manchalikere, 12.ix.2008, collc. S.K. Mandal. District : Shimago : 2♀♀, Shimago, 23.ix.2008, collc. S.K. Mandal.

Diagnosis : Body small in size; head considerably shorter than pronotum; antennae short, not reaching the posterior margin of pronotum; hind femora with a rounded genicular lobe; broad black or dark green stripe running behind the lower part of the eyes and below the lateral carinae of pronotum.

Distribution : India (karnataka, Throughout India).

Elsewhere : Myanmar; S.E. China; Thailand and Vietnam.

Remarks : This species is associated with grass habitation.

Genus ***Hieroglyphus*** Kraus, 1877

1. Cercus bifurcate at apex in male; subgenital plate with parallel ridges in female .... *banian* Fabricius

– Cercus with elongate acute apex in male; oblique on upper margin subgenital plate without parallel ridges....*nigrorepletus* Bolivar

34. ***Hieroglyphus banian*** (Fabricius)

1798. *Gryllus banian* Fabricius, *Ent. Syst. Suppl.*, : 194.

1973. *Hieroglyphus banian* : Mason, *Bull. Brit. Mus. nat. Hist. (Ent.), 28*(7) : 540.

Material examined : District : Shimoga : 1♂,Around the Alkola forest guest house, 23.ix.2008, collc. S.K. Mandal

Diagnosis : Medium in size; pronotum with median carina weak, cross by three sulci, first sulcus present laterally, second centrally, third and posterior sulci entire; prosternal process conical; cerci bifurcate, upper branch recurved anteriorly towards head and lower branch elongate and acute.

Distribution : India (Karnataka, Andhra Pradesh, Bihar, Himachal Pradesh, Madhya Pradesh, Maharastra, Manipur, Orissa, Punjab, Rajasthan, Sikkim, Tamil Nadu, Uttar Pradesh and West Bengal).

Elsewhere : Bangladesh.

Remarks : It is commonly known as a rice grasshopper.

35. ***Hieroglyphus ngrorepletus*** Bolivar

1912. *Hieroglyphus nigrorepletus* Bolivar, *Trab. Mus. nac. Cien. nat. Madr.*, no. **6** : 56.

1913. *Hieroglyphus bettoni* Kirby, *Fauna British India*, **1** : 203.

1915. *Hieroglyphus vastator* Carl, *Revue suisse zool.*, **24** : 481.

Material examined : Not available.

Diagnosis : Male : Large and robust; fastigium of vertex one and half times as broad as long; pronotum with only a weak median carina; tegmina and wings longer than abdomen or may be brachypterus; supra-anal plate angular, with subacute apex; cercus simple, elongate, slightly incurved, apex acute. Female : Fastigium of vertex two and half times as long as broad; subgenital plate with very acute median lobe.

Distribution : India (Karnataka, Assam, Kashmir, Maharastra, Orissa, Punjab, Uttar Pradesh, Uttaranchal, West Bengal).

Elsewhere : Pakistan.

Remarks : We have studied the species, which is present in National Zoological collections, ZSI, Kolkata. This species is taken from the literature (Tandon, 1972)

Genus ***Gesonula*** Uvarov, 1940

36. ***Gesonula punctifrons*** (Stol)*

1860. *Acridium (Oxya) punctifrons* Stal, *Kong. Sven. Fragatta Eug. Resa Omkring*, Jorden : 336.

1965. *Gesonula punctifrons* : Mischenko, *Locusts and Grasshoppers of USSR and adjacent countries. Catantopinae*, Leningard : 172.

Material examined : District : Shimoga : 1♂, Settihali wls, 13.ii.2010, collc. S.K. Mandal.

Diagnosis : Medium in size; antennae longer than head and pronotum together; pronotum narrow, long and rugose; prosternal tubercle conical; lateral lobes of pronotum wide, anterior margin oblique, anteroventral angles rounded; supra-anal platespoon shaped; upper valves of female ovipositor with small blunt teeth along the dorso-outer margin; hind tibiae at apex modified for swimming.

Distribution : India (Karnataka, Andaman islands, Arunachal Pradesh, Assam, Goa, Kerala, Maharastra, Manipur, Meghalaya, Orissa, Punjab, Tamil Nadu, West Bengal.

Elsewhere : Bangladesh; Borneo; China; Hainan; Japan; Java; Malacca; Myanmar; Philippines; Sri Lanka; Taiwan; Tonking and Thailand.

Remarks : In Karnataka we have found only from Settihali wild life santuary in Shimoga district. There is possibility of its occurrence in other areas, as this species is known to occur in mixed habitat of grass and low vegetation and mainly damage the water hyacinth in India.

Subfamily OXYINAE

Key to genus

1. Fully winged, folded tegmen, always touching in mid dorsal line prosternal tubercle simple, conical with subacute or rounded apex .... ***Oxya*** Audinet-Serville

– Micropterous spcies; prosternal tubercle broadened, flattened, transverse and trilobate at apex ..... ***Chitaura*** Bolivar

Genus ***Oxya*** Audinet-Serville

Key to species

1. Supra-anal plate with tubercle on each side of a median apical process in male; ovipositor valves with long teeth, the apical one curved in female 2

– Supranal plate without lateral tubercle in male; ovipositor valves with short teeth in female ..... ***nitidula*** (Walker)

2. Cercus laterally compressed, hardly narrowing apex, weakly bifurcate at apex in male; ventral surface of subgenital plate almost completely flat or weakly concave, appearing widely posteriorly in female .... ***fuscovittata*** (Marschall)

– Cercus conical, narrowing towards apex and obtuse or truncate apically in male; ventral surface of subgenital plate flat or concave only median posterior half, not widening posteriorly in female ..... ***hyla hyla*** Serville

37. ***Oxya fuscovittata*** (Marschall)

1836. *Gryllus fuscovittatus* Marschall, *Annln. Wien. Mus. Naturg.*, **1** : 211.

1971. *Oxya fuscovittata* : Hollis, *Bull. Brit. Mus. nat. Hist.* (Ent.), **26**(7) : 289.

Material examined : District : Shimoga : 1♂, 1♀, Shimoga, 23.ix.2008, coll. S.K. Mandal.

Diagnosis : Size medium; integument finely pitted and shiney; supra-anal plate with lateral tubercles are more prominent than posterior lobe; male cercus strongly compressed, apex strongly compressed or almost bifid; in female, ventral surface of subgenital plate broadly flattened, posterior margin emurginate medially, straight or with two very small median spines.

Distribution : India (Karnataka, Throughout).

Elsewhere : Afghanistan; Pakistan; USSR (South West).

Remarks : It is a common Indian gasshopper.

38. ***Oxya hyla hyla*** Serville

1831. *Oxya hyla* Serville, *Annls. Sci. nat.* (zool), **22** : 287.

1971. *Oxya hyla hyla* : Hollis, *Bull. Brit. Mus. nat. Hist.* (Ent.), **26** : 282.

Material examined : District : Chikmagalur : 3 ♂♂, Bhadra WLS, 22..ix.2008, collc. S.K. Mandal. District : Codagu : 2♂♂,around Tal Kavery wls, 17.ix.2008. District : Mysore : 1♀, Rajiv Gandhi National park, 12.ix.2008, coll. S.K. Mandal. District : Shimoga : 2♂♂,5♀♀, Shimoga around the shimoga forest rest house, 23.ix.2008, collc. S.K. Mandal; 3♂♂, 4♀♀, Haihole, Settihali wls, 13.ix.2010 and 14.ii. 2010, collc. S.K. Mandal.

Diagnosis: Body small and finely rugose, shiney; in male supra-anal plate with small tubercle; cercus with subacute apex; in female subgenital plate with two longitudinal ridges extending forwards from posterior margin.

Distribution : India (Karnataka, Arunachal Pradesh, Andhra Pradesh, Assam, Bihar, Goa, Himachal Pradesh, Karnataka; Madhya Pradesh, Meghalaya, Orissa, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh and West Bengal).

Elsewhere : Afghanistan; Africa; Bangladesh; Madagascar; Nepal; Pakistan; Persia and Sri Lanka.

Remarks : This species is widely distributed in different parts of Indan sub-continent and Africa.

39. ***Oxya nitidula*** (Walker)

1870. *Acridium nitidula* Walker, *Cat. Derm. Salt. Brit. Mus.*, **4** : 631.

1971. *Oxya nitidula* : Hollis, *Bull. Br. Mus. Nat. Hist (En.)* **26**(7) : 315.

Material examined : District : Chikmagalur : 3♀♀, Emralli village, Muthodi, 20 and 21.ix.2008, collc. S.K. Mandal. District : Codagu : 1♂, around Tal Kavery reserve forest, 17.ix.2008, collc. S.K. Mandal. District : Shimago : 3♂♂, around of Shimago F.R. House, 25.ix.2008, collc. S.K. Mandal; 2♀♀, Settihali wls, 13.ii.2010, collc. S.K. Mandal.

Diagnosis : Medium in size; pronotum narrowing forwards; tegmina reaching apex of hind femora; in male supra-anal plate rounded, triangular with basal folds; cercus conical, with truncate apex; in female ventral surface of subgenital plate with a pair of well developed submargino-lateral spines, posterior margin with a single spine and on each side of median aical spines.

Distribution : India (Karnataka, Andhra Pradesh, Goa, Kerala,Orissa, Rajasthan, Tamil Nadu and West Bengal).

Elsewhere : Sri Lanka.

Remarks : This species is earlier recorded from south India and Sri Lanka.

Genus ***Chitaura*** Bolivar, 1918

40. ***Chitaura indica*** Uvarov

1929. *Chitaura indica* Uvarov, *Revue Suisse Zool.*, **36** : 553.

Material examined : District : Chikmagalur : 1♀, Muthodi, Bhadra wls, 20.ix.2008, collc. S.K. Mandal. District : Mysore : 1♀, Rajiv Gandhi national park, 12.ix.2008, collc. S.K. Mandal. District : Shimoga : Mahatma Gandhi power project, 25.ix.2008, colc. S.K. Mandal.

Diagnosis : Size medium; fastigium of vertex roundly triangular from above, as long as, or almost as long as wide; antennae filiform, about as long as head and pronotum together; pronotum smooth; prosternal tubercle with apex antero-posteriorly flattened , trilobite apically; elytra and wings reduced to micropterous form, scale like; in male tength abdominal tegite with furcula on posterior margin.

Distribution : India (Karnataka and Kerala).

Remarks : It is very similar to genus *Oxya* in appearance but can be differentiated from reduced elytra and wings.

Subfamily COPTACRIDINAE

Key to genera

1. Frontal costa of ridge parallel sided, not or so

wider between antennae than vertex .... ***Coptacra*** Stal

– Frontal costa distinctly widened between antennae and wider than Vertex between eyes ..... ***Eucoptacra*** Bolivar

Genus ***Coptacra*** Stal, 1873

Key to species

1. Antennae distinctly ensiform; head and pronotum without rugose or granulose..... ..... *ensifera* Bolivar

– Antennae not ensiform; head and pronotum with rugosely punctuate and with raised granules ..... *punctoria* (Walker)

41. ***Coptacra punctoria*** (Walker)*

1870. *Acridium punctarium* Walker, *Cat. Derm. Salt. Brit. Mus.*, **4** : 630.

Material examined : District : Mysore : 1♀, Murkal kere, Rajiv Gandhi National park, 11.ix.2008, collc. S.K. Mandal.

Diagnosis : Size medium; head rugosely punctuate; antennae yellowish brown at base, dark at apex; interocular space narrower than the width of eyes; pronotum with small rugosities of dark brown or dark colour; wings hyaline, posterior part a little infumated; hind femur brown, area superia with two indistinct brown spots in the middle, area infero external black, inner area red; hind tibiae red.

Distribution : India (Karnataka,Andhra Pradesh, Kerala (Silent Valley), Madhya Pradesh, Tamil Nadu).

Remarks : This species is generally found in fallen dry leaves. One female example of this species have been collected from Mysore district.

42. ***Coptacra ensifera*** Bolivar

1902. *Coptacra ensifera* Bolivar, *Annls. Soc. ent. France*, **70** : 621.

1914. *Coptacra ensifera* : Kirby, *Fauna Brit. India, Orthopter, Acrididae, Orthoptera*, **1** : 239.

Material examined : Not available.

Diagnosis : Size medium; fastgium shortly tricarinate between the eyes, the middle carina produced backwards; frontal costa not or a little wider between the antennae; antennae ensiform; pronotum rugose, a little tectiform, crossed by all the three sulci; posterior margin obtusely angular; lateral carina of pronotum absent; wings yellowish hyaline; posterior tibiae red.

Distribution : India (Karnataka, Kerala, Tamil Nadu).

Remarks : This species is taken from the literature (Kirby, 1914).

Genus ***Eucoptacra*** Bolivar, 1902

43. ***Eucoptacra saturata*** (Walker)*

1870. *Acridium saturatum* Walker, *Cat. Derm. Salt. Br. Mus. Pt. III Locustidae* 628

1921. *Eucoptacra saturate* : Uvarov, *Ann. Mag. nat. Hist.*, (9) **7** : 503.

Material examined : District : Mysore : 4♀♀, Gundappa,13.ix.2008, collc. S.K. Mandal. District : Shimoga : 5♀♀,Shettihali wls,13.ix.2010, collc. S.K. Mandal. 1♂,Haihole, near Shettihali wls, 14.ix.2010. 4♀♀,Saravati wls, 15 & 16,ii.2010, collc. S.K. Mandal.

Diagnosis : Size medium; body rusty red brown; head short, smooth; tip of vertex flat, punctured; prosternal tubercle, stout, a little acute; hind femur black beneath, hind tibia red, as long as the hind femora; tegmina a little shorter than the body, with numerous small marks; wings hyaline.

Distribution : India (Karnataka, Assam, Himachal Pradesh, Madhya Pradesh, Manipur, Meghalaya, Orissa, Sikkim, Tripura,Uttar Pradesh and West Bengal).

Remarks : Generally found in North West India.

Subfamily TROPIDOPOLINAE

Key to genera

1. Prosternal tubercle compressed laterally, slightly bent backwards, not reaching the

anterior margin of mesonotum and obtuse at apex ..... ***Oxyrrhepes*** Stal

– Prosternal tubercle very broad at lower surface, bent backwards touching the anterior margin of mesonotum, broadly flattened behind the middle, apex more or less truncate .... ***Tristria*** Uvarov

Genus ***Oxyrrhepes*** Stal

44. ***Oxyrrehepes obtusa*** (de Haan)*

1842. *Acridium (Oxya) obtusum* Haan, *Verh. Ned. Overz. Bezit. Orth.*, 155, 156.

1929. *Oxyrrehepes obtuse* : Willemse, *Treubia*, **10** : 463.

Material examined : District : Shimoga : 1♀, Joga, Saravati wls, 17.ii.2010, collc. S.K. Mandal.

Diagnosis : Medium size; body slender; antennae filiform; head reclinate; fastigium of vertex short with and elongate concavity; median carina of pronotum well developed; lateral carina indistinct, parallel, principal sulcus placed behind the middle; prosternal process compressed laterally, apex a little bent backwards, conical; hind femur knee lobes rounded; supra-anal plate long, triangular apex pointed; cercus only reaching a little behind the supra-anal plate, a little curved, apex pointed.

Distribution : India (Karnataka, kerala, Madhya Pradesh, Manipur, Meghalaya, Orissa, Rajasthan, Sikkim and Tamil Nadu).

Elsewhere : Celebes; Chaina; Indo-China; Indonesia; Java; Lombock; Myanmar; Sri Lanka; Sumatra; Taiwan.

Remarks : This species is limited in *Distribution* in Karnataka.

Genus ***Tristria*** Stal, 1873

45. ***Tristria pulvinata*** (Uvarov)*

1921. *Tapinophyma pulvinata* Uvarov, *Ann. Mag. Nat. Hist.*, *7*(9) : 497.

1929. *Tristria pulvinata* : Uvarov, *Revue Suisse Zool.*, **29** : 559.

Material examined : District : Shimoga : 2♂♂, Saravati wls, 16.ii.2010, collc. S.K. Mandal.

Diagnosis : Size medium; fastigium of vertex parabolic, moderately narrow; tegmina and wings extending upto the apex of subgenital plate or shorter; male circus in apical third incurved, down curved laterally; female subgenital plate with an angular projection on the posterior margin on either side of mid line; male subgenital plate almost linear, compressed knife like.

Distribution : India (Karnataka, Andhra Pradesh, Assam, Bihar, Karnataka, Maharastra, Orissa, Tamil Nadu, Uttar Pradesh.

Elsewhere : Sri Lanka.

Remarks : This species is first time recorded from Karnataka state.

Subfamily EYEPREPOCNEMIDINAE

Key to genera

1. Apex of abdomen flated; supra-anal plate with some what obtuse rounded at apex 2

– Apex of abdomen inflated; supra anal plate with angular apex ..... ***Heteracris*** Walker

2. Posterior femur moderately long (14-15), moderately produced beyond abdomen, not inflated basally, not strongly narrowing on apical half; posterior tibiae with sparse spines; prosternal process cylindrical, with with rounded or inflated apex .... ***Eyprepocnemis*** Fieber

– Posterior femur long, produced far beyond end of abdomen, inflated basally and strongly narrowed on apical half; posterior tibiae densely spined, prosternal process almost spathulate, with rounded, some slightly inflated at apex ..... ***Tylotropidius*** Stal

Genus ***Eyprepocnemis*** Fieber, 1853

46. ***Eyprepocnemis alacris alacris*** (Serville)

1839. *Acridium alacre* Serville, *Hist. Nat. Ins. Orth.*,: 682.

1958. *Eyprepocnemis alacris alacris* : Dirsh, *Proc. R. ent. Soc. London,* (B)*27*(3-4) : 40.

Material examined : District : Shimoga :1♂, Shimoga, 23.ix. 2008, collc. S.K. Mandal.

Diagnosis : Size medium; concavity of fastigium of vertex distinct, without median carinula; pronotum with lateral carinae converging forwards; prosternal process cylindrical, apex obtusely rounded; in male cercus reaching a little beyond the supra anal plate; in female subgenital plate longer than broad; hind tibiae bluish grey with two whitish rings at base.

Distribution : India (Uttaranchal, Andhra Pradesh, Bihar, Delhi, Goa, Himachal Pradesh, Kerala, Madhya Pradesh, Manipur, Meghalaya, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal).

Elsewhere : Afghanistan; Bangladesh; E. Persia; Pakistan; Sri Lanka.

Remarks : This species is a widely distributed in India.

Genus ***Heteracris*** Walker, 1870

47. ***Heteracris pulchra*** (Bolivar)*

1902. *E (Uprepocnemis) pulchra* Bolivar, *Annls. Soc. ent. France,* **70** : 630.

1958. *Heteracris pulchra* : Dirsh, *Tijdschr. Ent.*, **101** : 54.

Material examined : District : 1♂, Murkel Kere lake, Rajiv Gandhi National park, 21.ix.2008, collc, S.K. Mandal.

Diagnosis : Size medium; fastigium of vertex smooth, a little sulcated; prosternal process subcylindrical, compressed in front, obtuse at apex; cerci compressed and curved; colour olivaceous in general; pronotum with a broad velvety black stripe on the back and distinctly expanded and paler in the middle, borders green.

Distribution : India (Karnataka, Kerala, Orissa, Tamil Nadu, Uttar Pradesh, West Bengal).

Elsewhere : Sri Lanka.

Remarks : This species is limited in distribution. This species is first time recorded from Karnataka state.

Genus ***Tylotropidius*** Stal, 1873

48. ***Tylotropidius varicornis*** (Walker)

1870. *Heteracris varicornis* Walker, *Cat. Derm. Salt. Brit. Mus.,* **4** : 667.

1914. *Tylotropidius varicornis* : Kirby, *Faun. Brit. India, Orthoptera* : 265.

Material examined : District : Shimoga : 1♀, Haihole, Shethihali wls, 15.ii.2010, collc. S.K. Mandal; 2♂♂, 7♀♀, Joga,Saravati wls, 17.ii.2010, collc. S.K. Mandal.

Diagnosis : Size medium; fastigium of vertex with 2 depressions at the base; front of head oblique prosternal process compressed, truncate and a little notched in the middle of apex; posterior femora thick at base, very slender and long towards apex; supra-anal plate of male elongated-traingular and sulcated; dorsum of pronotum dark brown, tegmen with a row of triangular strip in costal area.

Distribution : India (Karnataka, Andhra Pradesh, Chattrishgarh, Goa, Himachal Pradesh, Kerala, Maharastra, Meghalaya, Orissa, Rajasthan, Tamil Nadu, uttaranchal, West Bengal).

Elsewhere : Myanmar; Sri Lanka.

Remark : The distribution is very parse but range of distribution is wide.

Subfamily CATANTOPINAE

Key to genera

1. Tegmina lateral lobiform, extending beyond first abdominal segment ..... ***Paraconophyma*** Uvarov

– Tegmina and wings well developed, reaching upto or beyond the apex of abdomen 2

2. Prosternal process cylindrical and rounded at apex; pronotum sub-cylindrical ..... ***Catantops*** Schaum

– Prosternal process neither cylindrical nor with rounded apex; pronotum not subcylylindrical 3

3. Pronotum not constricted; prosternal process laterally compressed ..... ***Stenocatantops*** Dirsh and Uvarov

– Pronotum constricted; prosternal process conical .... ***Xenocatantops*** Dirsh and Uvarov

Genus ***Paraconophyma*** Uvarov, 1921

49. ***Paraconophyma scabra*** (Walker)*

1870. *Caloptenus scaber* Walker, *Cat. Derm. Salt. Brit. Mus.*, **4** : 707.

1921. *Paraconophyma scabra* : Uvarov, *Ann. Mag. nat. Hist.*, (9) **7** : 500, 501.

Material examined : District : Shimoga : 3♀♀,M. Gandhi power project, 25.ix.2010, Collc. S.K. Mandal; arround Shethihali forest rest house, Sethihali wls, 14.ii.2010, collc. S.K. Mandal.

Diagnosis :Body small in size; dark-brown in colour, with black markings; pronotum with median carina crossed by 2 or even 3 sulci; lateral carinae develop before the first sulcus only and distinctly convergent behind; punctuation of pronotal disc, pleurae, mesonotum, metanotum, and abdominal tergites very coarse and strong; hind tibiae muddy green, with a pale sub-basal ring; supra-anal plate of male hind angle straight, sharp.

Distribution : India (Karnataka, Himachal Pradesh, Jammu and Kashmir, Manipur, Rajasthan, Tamil Nadu, Uttar Pradesh, Uttaranchal, and West Bengal).

Remarks : This species is newly recorded from Karnataka state.

Genus ***Catantops*** Schaum, 1853

Key to species

1. External disc of hind femur with two broad incomplete fascia ..... ***henryi*** Bolivar
– External disc of hind femur not as above 2
2. Male cercus simple, with sub-acute apex .... ***pulchellus*** (Walker)

50. ***Catantops henryi*** Bolivar*

1918. *Catantops henryi* Bolivar, *Revta R. Acad. Cience. exact. fis. nat.* Madrid, **16** : 404.

1956. *Catantops henryi* : *Dish, Publcoes. Cult. Co. Diam. Angolar*, **28** : 90.

Material examined : District : Shimoga : 1♂, Haihole, Saravati wls,14.ii. 2010, collc. S.K. Mandal.

Diagnosis : Size medium; head shorter than pronotum; fastigium sub-pentagonal with convex anterior margin; antennae filiform, shorter than head and pronotum together; prosternal tubercle rounded at apex which is slightly inclined backwards; tegmen and wings extended beyond the apex of posterior femora; posterior femora with two broad incomplete fasciae on the external disc; cerci short, bifurcated at apex, the internal lobe short with rounded apex.

Distribution : India (Karnataka, Kerala, Maharastra, Goa); Upper Myanamar.

Remarks : *Catantops henryi* can be easily separated from the other species of the genus by their darker fasciae on the external disc of hind femur and bifurcated cerci.

Genus ***Xenocatantops*** Dirsh and Uvarv, 1953

Key to species

1. Male cercus showing no clear apical bifurcation, but apically bilaterally compressed and a little curved .... *humilis humilis* (Serville)
– Male cercus clearly bifurcate apically .... *karnyi* (Kirby)

51. ***Catantops pulchellus*** (Walker)

1870. *Cyrtacanthacris pulchellus* (Walker)

1943. *Catantops pulchellus* : Uvarov, *Ann. Mag. Nat. Hist.*, (11)**10** : 127.

Material examined : District : Shimoga :1♀, Haihole, Settihali wls, 15.ii.2010, collc. S.K. Mandal.

Diagnosis : Prosternal tubercle subcylindrical, inclined backwards, with rounded and slightly broadened apex; lateral lobe of pronotum, in the upper half, with a narrow longitudinal black stripe, the lower edge of which indistinct; external disc of hind femur with two longitudinal black stripes below the upper carinula, one in the middle,

another in the apical third, and with a small irregular black spot at the base of knee; male cercus simple, broadened at base, gradually narrowing towards apical part, and with rounded apex.

Distribution : India (Karnataka, Andaman Islands; Sikkim.

Remarks : It is also previously recorded from Karnataka state.

Genus ***Diabolocatan*** Jago, 1984

52. ***Diabolocaton tops innotabilis*** (Walker), 1870

1870. *Acridium innotabile* Walker, *Cat. Derm. Salt. Brit. Mus.*, **4** : 629.

1953. *Catantops pinguis innotabilis* : Dirsh and Uvarov, *Tijdsch. Ent.*, **96**(3) : 233.

Material examined : District : Dakhin Kanada : 1♂, Bhatkal, 20.ii.2010, collc. S.K. Mandal. District : Shimago : 3♀♀, Joga, 23.ix.2010, collc. S.K. Mandal.

Diagnosis : Size medium; lateral lobe of pronotum without coloured pattern; external disc of hind femur without black median spot below the upper carinula; male cercus more upcurved, with more broadened apex and projecting upper apical angle.

Distribution : India (Karnataka, Throughout).

Remarks : This species is widely distributed in Indian sub-continent. It is also widely distributed in Karnataka

53. ***Xenocatantops humilis humilis*** (Serville)

1839. *Acridium humile* Serville, *Ins. Orth.*, : 662.

1953. *Xenocatantops humilis humilis* : Dirsh, & Uvarov, *Tijdschr. Ent.*, **96** : 237.

Material examined : District : Codagu : 1♀♀, around Tal Kavery reserved forest, 17.ix.2008, collc. S.K. Mandal. District : Shimago : 2♀♀, Shethihali wls, 14.ii.2010, collc. S.K. Mandal; 1♀, Joga, Saravati wls, 16.ii.2010, collc. S.K. Mandal.

Diagnosis : Medium size; antennae longer than head and pronotum together; pronotal and thoracic markings much lighter with proportionately broader light oblique band on episternum III; Ratio of length to depth of hind femur never less than 3.45; male cercus with rounded apex.

Distribution : India (Karnataka, Andaman and Nicobar Island, Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Kerala, Madhya Pradesh, Maharastra, Manipur, Meghalaya, Mizoram, Tamil Nadu, Uttar Pradesh and West Bengal).

Elsewhere : Bangladesh; Borneo; Indo-China; Lombock; Malaya; Myanmar; New Guinea; Philippines; Sri Lanka; Sumatra; Thailand; S. Tibet; Vietnam and Yunan.

Remarks : This species is also found in moist forest parts near streams and rivers.

54. ***Xenocatantops karnyi*** (Kirby)*

1910. *Catantops karnyi* Kirby, *Syn. Cat. Orthopt.*, **3** : 483.

1982. *Xenocatantops karnyi* : Jago, *Trans. Am. ent. Soc.*, **108**(3) : 455.

Material examined : District : Shimoga : 3♂♂, 3♀♀, Haihole, Shethihali, 15.ii.2010, collc. S.K. Mandal.

Diagnosis : Size medium; pronotum constricted; prosternal process conical; posterior femur being with a row of black dots on the lower outer carina for the whole length; cercus with apical bifurcation bluntly pointed and subequal; epiphallus with distinct lophi almost square in plane view.

Distribution : India (Karnataka, Andaman Islands., Andhra Pradesh, Delhi, Himachal Pradesh, Tamil Nadu, Uttar Pradesh); Bangladesh; Sri Lanka; Myanmar; Thailand; Vietnam; Philippines; Indonesia.

Remarks : Specimens are collected from the single locality.

Genus ***Stenocatantops*** Dirsh and Uvarov

55. ***Stenocatantops splendens*** (Thunberg)*

1815. *Gryllus splendens* Thunberg, *Mem. Acad. Sci. St.-Petersh.*, **5** : 236.

1953. *Stenocatantops splendens* : Dirsh and Uvarov, *Tijschr. Ent.,* **96**(3) : 237.

Material examined : District : Shimga : 1♂, Shettihali wls, 13.ii.2010, collc. S.K. Mandal; 1♀, Haihole, Shettihali,15.ii.2010, coll. S.K. Mandal.

Diagnosis : Size medium; body more slender and elongated; middle joint of antennae about twice or three times as long as broad; prosternal tubercle strongly curved and inclined backwards in profile; colour brown or brownish testaceous.

Distribution : India (Karnataka, Arunachal Pradesh, Andaman and Nicobar Islands, Assam, Madhya Pradesh, Meghalaya, Orissa, Tamil Nadu, Uttar Pradesh and West Bengal).

Elsewhere : Borneo; Celebes; China; Hainan; Java; Korea; Malaya; Maluccus Islands; Myanmar; Phillippines; Sri Lanka; Sumatra; Thailand.

Remarks : This species is newly recorded from Karnataka.

Subfamily CYRTACANTHACRIDINAE

Key to genera

1. Prosternal tubercle straight, conical, vertical or slightly inclined backwards in the direction of mesosternum,male cercus elongate, conial; male subgenital plate acuminate, apex pointed ..... ***Pachyacris*** Uvarov

– Prosternal tubercle strongly curved backwards touching or almost touching mesosternum, inflated in middle, with acute or sub-acute apex; male cercus and subgenital plate not as above 2

2. Pronotum strongly tectiform; integument strongly rugose; median carina of pronotum sharp; male cercus incurved at base, about half as wide as its length ..... ***Chondracris*** Uvarov

– Pronotum moderately tectiform, slightly constricted; integument fairly rugose, almost smooth; male cercus with subacute apex ..... ***Cyrtacanthacris*** Walker

Pachyacris Uvarov, 1923

56. ***Pachyacris violascens*** (Walker)

1870. *Acridium violascens* Walker, Cat. *Derm. Salt. Brit. Mus.,* **3** : 387.

1965. *Orthacanthacris violascens* : Kirby, *Fauna British India, Orthoptera,* Aididae, **1** : 229.

1923. *Pachyacris violascens* : Uvarov, *Ann. Mag. Nat. Hist.,* **11**(9) : 478.

Material examined : Not available.

Diagnosis : Pronotum of prozona is shorter than metazona, its posterior margin rounded; lateral pronotum lobes compressed at prozonal area; disc of pronotum saddle shaped; median carina narrow, low, interrupted by punctuations; tegmina sub-hyaline, brownish spots indistinct; male cercus laterally compressed, widened gradually and regularly narrowed posteriorly, apex pointed, incurved; subgenital plate laterally compressed, acute pointed, upcurved long.

Distribution : India (Karnataka, Himachal Pradesh).

Elsewhere : Sri Lanka.

Remarks : This species is taken from the literature (Uvarov, 1923).

Genus ***Chondracris*** Uvarov, 1923

57. ***Condracris rosea*** De Geer*

1773. *Acridium roseum* de Geer, *Mem. Hist. Ins.,* **3** : 488.

1923. *Chondracris rosea* : Uvarov, *Bull. Ent. Res.,* **14** : 39.

Material examined : District : Shimoga : 1♂, Shimoga, 21.09.2008, collc. S.K. Mandal.

Diagnosis : Size large; body robust; median carina of pronoum raised in prozona and low straight in profile in metazona; uniformly green, wings hyaline with base rose; hind tibiae and tarsi red.

Distribution : India (Karnataka, Andhra Pradesh, Assam, Bihar, Himachal Pradesh, Kerala, Madhya Pradesh, Manipur, Orissa, Sikkim, Tamil Nadu, Uttar Pradesh, Uttaranchal, Tripura and West Bengal).

Elsewhere : Bangladesh; Bhutan; China; Hainan; Indonesia; Java; Korea; Manchuria; Philippines; Tawaine; Thailand; Vietnam.

Cyrtacanthacris Walker, 1870

58. ***Cyrtacanthacris tatarica*** (Linnaeus)*

1758. *Gryllus Locusta tataricus* Linnaeus, *Systema Naturae (10th ed.)* : 432.

1923. *Cyrtacanthacris tatarica* : Uvarov, *Bull. Ent. Res.*, **14** : 39.

Material examined : District : Shimoga : 2♂♂, Mahatma Gandhi power project, 25.ix.2008, collc. S.K. Mandal.

Diagnosis : Size large; pronotum on both sides above with a broad velvety blackish brown band; tegmina with thick and dense reticulation and transverse oblique fasciae or irregular spots; wings hyaline or sometimes yellowish at base; hind tibiae bluish or brown with yellow or brown spines, tips black.

Distribution : India (Karnataka, Andhra Pradesh, Assam, Bihar, Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir, Kerala, Maharastra, Manipur, Orissa, Rajasthan, Tamil Nadu, Uttaranchal, Uttar Pradesh, West Bengal).

Elsewhere : Africa (except North Africa) and Sahara; Hainan, Madagascar; Phillipines; Seychelles; Sri Lanka; Sumatra and Thailand.

Remarks : Multivorous species.

SUMMARY

Fifty eight species and subspecies of grasshoppers have been reported from Karnataka state. They belong to 44 genera and 2 families. Of these nineteen species and subspecies are new locality records, key to subfamilies, families, genera and species have been provided.

ACKNOWLEDGEMENTS

We are grateful to the Director, Zoological Survey of India, for laboratory facilities. We are also thankful to Dr. A.K. Sanyal, Additional Director, for going through the manuscript, and for helping us in many ways to complete this work. Thanks are due to O/C Orthoptera section. Our thanks are also due to officers and staff of the Survey for the collections of these material from Karnataka State.

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FAUNA OF KARNATAKA (INDIA) ECOSYSTEM

Name of the districts	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
Name of the species													
Atractomorpha crenulata	+	+	–	+	+	+	–	+	–	–	+	–	
	–	+	–	–	–	–	–	–	–	–	+	–	
Pyrgomorpha bispinosa bispinosa	–	–	–	+	–	–	–	–	–	–	+	–	
Chrotogonus tr. trachypterus	–	+	–	–	+	–	–	+	–	–	+	–	
Chrotogonus oxy. oxypterus	–	–	+	–	–	–	–	–	–	+	–	–	
Spathosternum pr. prasiniferum	+	+	+	+	+	–	–	+	+	–	+	–	
Hieroglyphus banian	+	–	–	–	–	–	–	–	–	–	–	–	
Hieroglyphus nigrorepletus	–	–	–	–	+	–	–	–	–	–	–	–	
	–	–	+	–	–	–	–	–	–	–	–	–	–
	–	–	+	–	–	–	–	–	–	–	–	–	–
	+	–	–	–	–	–	–	–	–	–	–	–	–
Oxya hyla hyla	–	+	–	–	+	–	–	–	–	–	–	–	–
Oxya fuscovittata	–	+	–	–	+	–	–	–	–	–	–	–	–
Eucoptacra saturata	+	–	+	–	–	–	+	–	–	–	–	–	–
Coptacra foedata		+											
Oxyrrhepes obtusa	–	+	–	–	–	–	–	–	–	–	–	–	–
	–	+	–	–	+	–	–	–	+	–	+	–	–
									–	–	–	–	–
Eyprepocnemis al. alacris	+	–	–	–	+	–	–	–	–	–	–	–	–
Heteracris pulcher	_	+	–	–	–	+	–	–	–	–	–	–	–
Tylotropidius varicornis	+	+	–	–	–	–	–	–	+	–	–	–	–
Paraconophyma scabra	+	+	–	–	+	–	+	–	+	–	+	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–
Paraconophyma scabra	+	+	–	–	+	–	+	–	+	–	+	–	–
Catantops pinguis innotabilis	+	+	+	–	–	–	–	–	–	–	–	–	–
Xenocatantops humili humilis	+	+	+	–	–	–	–	–	–	–	–	–	
Xenocatantops karnyi	–	–	–	–	+	–	–	–	–	–	–	–	–
Stenocatantops splendens	+	–	–	–	–	–	–	–	–	–	–	–	–
Cyrtacanthacris tatarica	–	–	+	–	–	–	–	–	–	–	–	–	–
	+	–	–	–	–	–	–	–	–	–	–	–	–
Pachyacris vinosa	–	+	–	–	–	–	–	–	–	–	–	–	–
Acrida exaltata	–	+	+	–	+	–	–	+	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–
Phlaeoba infumata	–	+	–	–	+	–	–	+	+	–	+	–	–

Name of the districts	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
Phlaeoba antennata	–	–	–	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–
Ceracris nigricornis nigricornis	–	+	–	–	–	–	–	–	–	–	–	–	–
	–	+	+	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–
	+	–	–	–	–	–	–	–	–	–	+	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	
Aulacobothrus lutepes	+	+	+	–	–	–	–	–	+	–	–	–	–
Aulacobothrus desicus	+	+	–	–	+	–	–	–	+	–	–	–	–
Leva indica	+	+	+	–	–	–	–	–	+	–	–	–	–
Aiolopus th. tamulus	+	+	+	–	+	–	–	+	+	–	–	–	–
Heteropternis respondens	–	–	–	–	–	–	–	–	–	–	–	–	–
Oedaleus abruptus	–	+	–	–	+	–	+	–	+	–	–	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–
	–	+	+	–	–	–	–	+	–	–	–	–	–
Gastrimargus africanus africanus	–	–	–	–	–	–	–	+	+	–	–	–	–
Trilophidia annulata	–	+	+	–	–	–	+	+	–	–	–	–	–
Acrotylus humbertianus	–	+	–	–	–	–	–	–	–	–	–	–	–
Morphacris fasciata sulcata	–	–	–	–	–	–	–	–	–	–	–	–	–
Pternoscirta cintifemur	–	–	+	–	–	–	–	–	–	–	–	–	–
	+	+	–	–	–	–	–	–	–	–	–	–	–
	–	–	+	–	–	–	–	–	–	–	–	–	–

Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 123-124, 2013

DERMAPTERA

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INTRODUCTION

Even though there is no comprehensive work on Dermaptera fauna of Karnataka state, based on the Fauna of India, Dermaptera parts I and II by Srivastava (1988,2003) and studies of Oriental Dermaptera by Srivastava (1990) and Steinmann (1975) and other references a detailed account of check-list of Dermaptera fauna of Karnataka has been prepared. This list contains a total of 32 species belonging to 19 genera under 13 subfamilies of 6 families and 3 super families. Inspite of cosmopolitan distribution of the 3 species *Euborellia annulipes* (Lucas, 1847), *Nala lividepes* (Dufour, 1820) and *Labidura riparia* (Pallas, 1773), there are no reports on the occurrence of *Euborellia annulipes* (Lucas, 1847) from Karnataka state.

SYSTEMATIC POSITION

Superfamily PYGIDICRANOIDEA
(= Protodermaptera Zacher, 1911)
Family PYGIDICRANIDAE Verhoeff, 1902
Subfamily PYGIDICRANINAE Verhoeff, 1902
Genus ***Cranopygia*** Burr, 1908

1. *Cranopygia burri* Hincks, 1955
2. *Cranopygia vittipenis* Hincks, 1955

Subfamily ECHINOSOMATINAE Burr, 1910
Genus ***Echinosoma*** Serville, 1839

3. *Echinosoma parvulum* Dohrn, 1863
4. *Echinosoma trilineatum* Borelli, 1921

Subfamily DIPLATYINAE Verhoeff, 1902
Genus ***Diplatys*** Serville, 1831

5. *Diplatys chopardi* Hincks, 1955
6. *Diplatys excidens* Hincks, 1954
7. *Diplatys confusus* Hincks, 1955
8. *Diplatys coelebs* Hincks, 1955
9. *Diplatys jawalagiriensis* Kapoor, Bharadwaj & Banarjee, 1971
10. *Diplatys lefroyi* Burr, 1910
11. *Diplatys carinatus* Srivastava 1988

Superfamily FORFICULOIDEA
(= Eudermaptera Verhoeff, 1902)
Family FORFICULIDAE Stephens, 1831
Subfamily OPISTHOCOSMIINAE Verhoeff, 1902
Genus ***Hypurgus*** Burr, 1907

12. *Hypurgus humeralis* (Kirby, 1891)

Family CHELISOCHIDAE Burr, 1907
Subfamily CHELISOCHINAE Burr, 1907
Genus ***Chaetospania*** Karsch, 1886

13. *Chaetospania nigriceps* (Kirby, 1891)
14. *Chaetospania acuminata* Srivastava, 1990

Genus ***Adiathetus*** Burr, 1904

15. *Adiathetus tenebrator* (Kirby, 1891)

Family SPONGIPHORIDAE
(= Labiidae Burr, 1909)
Subfamily SPONGIPHORINAE Burr, 1911
Genus ***Spongovostox*** Burr, 1911

16. *Spongovostox anamalaiensis* Srivastava, 1969

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17. *Spongovostox semiflavus* (Bormans, 1894)

Subfamily LABIINAE Burr, 1911

Genus ***Apovostox***

18. *Apovostox serratus* (Kapoor, 1967)

Genus ***Labia*** Leach, 1815

19. *Labia curvicauda* Motschulsky, 1863

Superfamily ANISOLABOIDEA

Family ANISOLABIDIDAE

(= Carcinophoridae Popham, 1965)

Subfamily TITANOLABIINAE

Genus ***Titanolabis*** Burr, 1910

20. *Titanolabis maindroni* (Borelli, 1911) (= *Labidurodes orientalis* Ramamurthi, 1968).

Subfamily CARCINOPHORINAE Hincks, 1954

Genus ***Paralabis***

21. *Paralabis lefroyi* (Burr, 1910)

22. *Paralabis greeni* (Burr, 1899)

Subfamily PLATYLABIINAE Burr, 1910

Genus ***Platylabia*** Dohrn, 1865

23. *Platylabia* sp. Srivastava 1990

Subfamily ANISOLABIINAE

Genus ***Euborellia*** Burr, 1910

24. *Euborellia annulata* (Fabricius, 1793)

25. *Euborellia stali* (Dohrn, 1864)

Genus ***Anisolabella*** Zacher, 1911

26. *Anisolabella dohrni* (Kirby, 1891)

27. *Anisolabella nandii* (Srivastava, 1987)

Genus ***Gonolabis*** Burr, 1911

28. *Gonolabis krishnappai* Srivastava, 2003

Subfamily BRACHYLABIDINAE Burr, 1909

Genus ***Ctenisolabis*** Verhoeff, 1902

29. *Ctenisolabis fletcheri* Burr, 1910

Family LABIDURIDAE Verhoeff, 1902

Subfamily LABIDURINAE Burr, 1909

Genus ***Labidura*** Leach, 1815

30. *Labidura riparia* (Pallas, 1773)

Genus ***Forcipula*** Bolivar, 1897

31. *Forcipula quadrispinosa* (Dohrn, 1863)

Subfamily NALINAE Steinmann, 1975

Genus ***Nala*** Zacher, 1910

32. *Nala lividepes* (Dufour, 1820)

ACKNOWLEDGEMENTS

We are very much grateful to Dr. K. Venkataraman, Director, Zoological Survey of India, Kolkata for providing necessary facilities and Late Dr. G. Thirumalai, Additional Director, ZSI, Chennai who has inspired us to do this work. We are very much indebted to Dr. G.K. Srivastava, Retd. Addl. Director, ZSI for his valuable suggestions. Thanks are also due to O/C Coleoptera section and the other staffs for constant encouragement.

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Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 125-126, 2013

INSECTA : EMBIOPTERA

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INTRODUCTION

The order Embioptera includes primitive insects commonly known as web-spinners or embiids. Medium sized (5 to 25 mm) insects with body elongate and dorso-ventrally flattened. Their mouth parts are chewing type, antennae filiform and metatarsus of forelegs swollen containing glands and spinnerets. The winged members have two pairs of elongate, membranous similar wings. The wings remain folded over the back at rest. Males are generally winged and females are apterous. They have a unique ability in the world of insects to spin the silk threads with their feet. These webs serve for the protection against predacious insects, for regulating the humidity and for laying the eggs. The reproduction takes place by both sexual as well as parthenogenesis. The females exhibit parental care as they remain near the eggs and young ones. They inhabit the humid places like under stones, leaves, bark and other objects. They usually shun the light. Their food consists of almost anything of vegetable origin. Some species of genus *Oligotoma* also live in association with spiders, ants and termites. The studies on web-spinners and their association with termites and other arthropods will throw some light on evolution of commensalisms and socialism in insects. They play an important role in the formation of the humus and improvement of the soil quality.

These insects are found in all continents but their distribution is discontinuous. About 317 species under eight families are known throughout the world (Ross, 1999) and thirty one species belonging to two families viz. Embiidae and Oligotomidae are known from India, covering the various ecosystems (Chandra & Sharma, 2009).

The work on Indian Embioptera is very limited may be due to poor speciation in the order. The South Indian fauna was studied in the past by Ananthakrishnan and Ananthasubramanian (1956), Ananthasubramanian and Ananthakrishnan (1960), Bradoo (1971) and Ross (1943, 1950). The Karnataka fauna of embiids is represented by 7 species of 3 genera under two families.

Order EMBIOPTERA

Family EMBIIDAE

1. *Pseudembia truncata* Davis, 1939

   Distribution : Karnataka : Dharwar

Family OLIGOTOMIDAE

2. *Aposthonia josephii* (Bradoo, 1971)

   Distribution : Karnataka : Dharwar

3. *Oligotoma ceylonica ceylonica* Enderlein, 1912

   Distribution : Karnataka : Dharwar

4. *Oligotoma dharwariana* Bradoo, 1971

   Distribution : Karnataka : Dharwar

5. *Oligotoma humbertiana* (Saussure, 1896)

   Distribution : Karnataka: Bhadrawate, Mysore, Dharwar

6. *Oligotoma minuscula* Enderlein, 1912

   Distribution : Karnataka : Dharwar

7. *Oligotoma saundersii* (Westwood, 1837)

   = *Oligotoma latreillei* Rambur, 1842

   = *Oligotoma insularis* McLachlan, 1883

= *Oligotoma cubana* Hagen, 1885
= *Oligotoma bramina* Saussure, 1896
= *Oligotoma hova* Saussure, 1896
= *Oligotoma rochai* Navas, 1917
= *Oligotoma inaequalis* Banks, 1924
Distribution : Karnataka: Dharwar

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Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 127-128, 2013

INSECTA : MANTODEA

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INTRODUCTION

The insects commonly known as 'Praying Mantids' are carnivorous and peculiar in respect of their body structure, prey capture, camouflage and reproductive behaviour. General body color of the mantids varies from green to pale brown. Being predators they play a very important role in biological control of harmful insects. They are weak fliers and occur in all habitats from plains to hills, seen mostly in bushes, herbs and shrubs. Very often they are encountered at light as they get attracted to electric bulbs, tube lights etc.

World wide about 2310 species of 432 genera are known, of which, 162 species of 68 genera occur in India (Mukherjee *et al.*, 1995 and Hazra and Mukherjee, 1998). A perusal of literature revealed that so far 23 species of 20 genera under 2 families (14% of Indian diversity) are recorded from Karnataka State including a new record of mantid (Ghate *et al.*, 2000). Further explorations may yield in addition of some more species from the state.

Order MANTODEA

Family HYMENOPODIDAE

Subfamily ACROMANTINAE

Tribe **Acromantini Beier**

1. *Acromantis insularis* Giglio-Tos
   Distribution: Karnataka : Jog falls
2. *Ephestiasula intermedia* Werner
   Distribution : Karnataka: Hubli
3. *Euantissa pulchra* (Fabricius)
   Distribution : Southern India

Subfamily HYMENOPODINAE

4. *Creobroter apicalis* Saussure
   Distribution : Kumta, Karnataka

Family MANTIDAE

Subfamily CHOERADODINAE

5. *Choeradodis cancellata* (Fabricius)
   Distribution : South India

Subfamily TARACHODINAE

6. *Didymocorypha lanceolata* (Fabricius)
   Distribution : Karnataka
7. *Dysaules longicollis* Stãl
   Distribution : Karnataka: Bangalore
8. *Oxyophthalma gracilis* Saussure
   Distribution : Karnataka

Subfamily LITURGUSINAE

9. *Humbertiella affinis* Giglio-Tos
   Distribution : Karnataka: Bangalore
10. *Humbertiella ceylonica* Saussure
    Distribution : Karnataka: Belgaum, Londa
11. *Humbertiella indica* Saussure
    Distribution : Karnataka
12. *Theopompa ophthalmica* (Olivier)
    Distribution : Southern India

Subfamily OXYOTHESPINAE

13. *Heterochaetula fissispinis* Wood-Mason
    Distribution : Karnataka : Mehabobnagar

Subfamily IRIDOPTERYGINAE

Tribe **Iridopterygini**

14. *Parananomantis brevis* Mukherjee
    Distribution : Karnataka

Tribe Tropidomantini

15. *Eomantis guttatipennis* (Stãl)
Distribution : Karnataka

Subfamily AMELINAE

16. *Elmantis trincomaliae* (Saussure)
Distribution: Karnataka: Jog falls, Belgaon: Londa

17. *Gonypeta punctata* (De Haan)
Distribution : Karnataka

Subfamily MANTINAE

Tribe **Miomantini**

18. *Deiphobella laticeps* (Wood-Mason)
Distribution : Karnataka : Mysore.

Tribe **Mantini**

19. *Hierodula (Hierodula) doveri* Chopard
Distribution : Karnataka : Jog falls

20. *Hierodula (Hierodula) unimaculata* (Olivier)
Distribution : Karnataka : Mysore

21. *Mantis religiosa* Linnaeus
Distribution : Karnataka: Gulberga, Yadgir

Subfamily TOXODERINAE

Tribe **Toxoderini**

22. *Paradanuria orientalis* Wood-Mason
Distribution: Karnataka

23. *Toxomantis westwoodi* Giglio-Tos
Distribution : Karnataka

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Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 129-132, 2013

INSECTA : HOMOPTERA : MEMBRACIDAE

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INTRODUCTION

The members of the family Membracidae are small-size and phytophagous belonging to the auchenorrhychous Homoptera and can be easily recognised by the peculiar structure of the pronotum which frequently conceals the scutellum and takes different shapes, Horn-like process of the protonum, very oftenassuming curious bizarre shapes in different specieshave earned them the name "horn bugs" or "cow bugs". Although endowed with powers of flight, they prefer to hop about when disturbed and this habit has earned them the popular name "tree hoppers". The Indian Mambracidae diversity belongs to 233 species under 42 genera (Ananthasubramanian,1996). A perusal of literature revealed that in the state of Karnataka the Membracidae fauna is represented by 47 specias of 17 genera.

Family MEMBRACIDAE Rafinesque

Subfamily OXYRHACINAE Haupt

Tribe **Oxyrhacini** Distant

Genus ***Oxyrhachis*** Germar

1. ***Oxyrhachis brevicornutus*** Ananthasubramanian and Ananathakrishnan, 1975

Distribution : India : Tamilnadu (Madras), Karnataka (Bangalore)

2. ***Oxyrhachis lefroyi*** Distant, 1916

Distribution : India : Kerala (Ernakulam), Karnataka (Coorg)

3. ***Oxyrhachis palus*** (Buckton, 1905)

Distribution: India : Karnataka (Bangalore); Tamilnadu (Coimbatore)

4. ***Oxyrhachis rufescens*** Walker, 1851

Distribution: India : All over India

5. ***Oxyrhachis taranda*** (Fabricius, 1798)

Distribution: India : All over India

Subfamily CENTROTINAE Amyot and Serville

Tribe **Tricentrini** Ahmad and Yasmeen

Genus ***Tricentrus*** Stål

6. ***Tricentrus brevis*** Funkhouser, 1914

Distribution : India : Karnataka (Coorg).

Elsewhere : Indonesia : Banguey.

7. ***Tricentrus decornis*** Ananthasubramanian and Ananathakrishnan, 1975

Distribution : India : Tamilnadu (Madras); Karnataka (Mysore)

8. ***Tricentrus fairmairei*** (Stål, 1859)

Distribution: India : Karnataka (Bangalore, Mercara).

Elsewhere : East Asia : Philippines

9. ***Tricentrus horizontalis*** Distant, 1916

Distribution: India : Karnataka (Coorg).

Elsewhere : Burma (Moulmein)

10. ***Tricentrus nobilis*** Ananthasubramanian, 1980

Distribution : India : Karnataka (Mysore).

11. ***Tricentrus pilosus*** Ananthasubramanian and Ananathakrishnan, 1975

Distribution : India : Tamilnadu (Madras); Karnataka (Bangalore); Kerala (Trivandrum); Andhra Pradesh (Hyderabad); Andamans

Genus ***Deitzius*** Ananthasubramanian

12. ***Deitzius tomentosus*** (Ananthasubramanian, 1980)

Distribution : India : Karnataka (Bangalore)

Genus ***Lanceonotus*** Capener

13. ***Lanceonotus cinnamomi*** Ananthasubramanian, 1980

Distribution : India : Karnataka (Mercara)

Genus ***Leptocentrus*** Stål\

14. ***Leptocentrus insignis*** Distant, 1951

Distribution : India : Karnataka (Coorg)

15. ***Leptocentrus leucaspis*** (Walker, 1851)

Distribution : India : Tamilnadu (Madras), Karnataka (Bangalore), Andhra (Vijayawada, Guntur).

Elsewhere : Sri Lanka; Philiphines; Borneo; Malaysia

16. ***Leptocentrus rhizophagus*** Ananthasubramanian and Ananathakrishnan, 1975

Distribution : India : In all southern states

17. ***Leptocentrus substitutus*** (Walker, 1851)

Distribution : India : All over.

Elsewhere : Srilanka; Central China

Genus ***Nilautama*** Distant

18. *Nilautama typica* Distant, 1908

Distribution : India : Karnataka (Bangalore), Assam.

Elsewhere : Burma

Genus ***Dograna*** Distant

19. ***Dograna suffulta*** Distant, 1908

Distribution : India : Karnataka (Coorg), Kerala (Palghat), Maharashtra (Bombay).

Genus ***Otinotus*** Buckton

20. ***Otinotus elongatus*** Distant, 1908

Distribution : India : Kerala (Trivandrum), Karnataka (Bangalore), Assam, West Bengal, Orissa

21. ***Otinotus mysorensis*** Ananthasubramanian, 1980

Distribution : India : Karnataka (Mysore)

22. ***Otinotus obliquus*** Ananthasubramanian and Ananathakrishnan, 1975

Distribution : India : Kerala (Trivandrum), Karnataka (Bangalore), Tamilnadu (Madras, Coonoor)

23. ***Otinotus oneratus*** (Walker, 1858)

Distribution : India : All over India.

Elsewhere : Sri Lanka

24. ***Otinotus pallescens*** Distant, 1908

Distribution : India : Maharashtra (Bombay), West Bengal (Calcutta), Karnataka (Bangalore), Punjab, Uttar Pradesh

Genus ***Emphusis*** Buckton

25. ***Emphusis malleus*** (Walker, 1851)

Distribution : India : Karnataka (Coorg), Maharashtra (Bombay).

Elsewhere : Sri Lanka; North Borneo; Malaysia

Genus ***Centrotypus*** Stål

26. ***Centrotypus ortus*** Distant, 1908

Distribution : India : Tamilnadu (Aiyur, N. Salem, Jawalgiri, Naganoor); Karnataka (Coorg, Mysore), Uttar Pradesh (Dehra Dun); Madya Pradesh (Balaghat).

Genus 26. ***Anchon*** Buckton

27. ***Anchon pilosum*** (Walker, 1851)

Distribution : India : Kerala (Trivandrum), Karnataka (Mysore), Tamilnadu (Coimbatore); Maharashtra (Bombay).

Elsewhere : Sri Lanka.

28. ***Anchon rectangulatum*** (Kirby, 1891)

Distribution : India : Karnataka (Mysore).

Elsewhere : Sri Lanka.

29. ***Anchon ulniforme*** Buckton, 1903

Distribution : India : Kerala (Trivandrum), Karnataka (Mysore), Tamilnadu (Madras); West Bengal (Darjeeling), Uttar Pradesh.

Elsewhere : Burma (Tenasserim); Sumatra; Java.

Tribe ***Uroxiphini*** Goding

Genus ***Insitoroides*** Funkhouser,

30. ***Insitoroides typica*** Funkhouser, 1933

Distribution : India : Karnataka (Fraserpet, Coorg)

Genus ***Cryptaspidia*** Stål

31. *Cryptaspidia piceola* (Melichar, 1903)

Distribution : India : Karnataka (Fraserpet, Coorg).

Elsewhere : Sri Lanka.

Genus ***Gargara*** Amyot and Serville

32. ***Gargara affinis*** Distant, 1908

Distribution : India : Karnataka (Coorg, Mysore), Maharashtra (Bombay), Uttar Pradesh (Dehra Dun).

Elsewhere : Burma (Tenasserim); Borneo; Philippine Islands.

33. ***Gargara aurea*** Funkhouser, 1933

Distribution : India : Karnataka (Fraserpet, Coorg)

34. ***Gargara extrema*** Distant, 1916

Distribution : India : All over.

Elsewhere : Sri Lanka.

35. ***Gargara mixta*** (Buckton, 1903)

Distribution : India : All over.

Elsewhere : Sri Lanka (Colombo); Burma (Tenasserim); Borneo; China

36. ***Gargara penangi*** Funkhouser, 1918

Distribution : India : Tamilnadu Salem), Karnataka (Coorg).

Elsewhere : Malaysia; Penang; Borneo

37. ***Gargara pulchripennis*** Stål

Distribution : India : Tamilnadu (Aiyur, Salem); Karnataka (Fraserpet, Coorg).

Elsehwere : Philippines

38. ***Gargara sikhimensis*** Distant, 1908

Distribution : India : Karnataka (Shimoga), Sikkim

39. ***Gargara splendidula*** Distant, 1916

Distribution : India : Kashmir, Punjab, Karnataka (Coorg, Fraserpet), Uttar Pradesh (Dehra Dun)

40. ***Gargara varicolor*** Stål, 1870

Distribution : India : Tamilnadu (Aiyur, Salem), Karnataka (Coorg), Punjab (Chichawatni), Uttar Pradesh (Dehra Dun, Naini Tal)

Tribe **Coccosterphini** Distant

Genus ***Eucoccosterphus*** Ananthasubramanian & Ghosh

41. ***Eucoccosterphus mucronicollis*** (de Motschulsky, 1859)

Distribution : India : Karnataka (Coorg, Fraserpet).

Elsewhere : Sri Lanka.

Genus ***Coccosterphus*** Stål

42. ***Coccosterphus decoloratus*** Distant, 1908

Distribution : India : Keral (Trivandrum), Karanataka (Bangalore), West Bengal (Calcutta)

43. ***Coccosterphus mysorensis*** Anananthasubramanian and Ghosh, 1987

Distribution : India : Karnataka (Coorg)

Genus ***Parayasa*** Distant

44. ***Parayasa affixa*** Distant, 1916

Distribution : India : Tamilnadu (Salem, Ooty), Karnataka (Fraserpet, Coorg)

45. ***Parayasa maculosa*** Distant, 1916

Distribution : India : Tamilnadu (Kodaikanal), Karnataka (Coorg)

46. ***Parayasa nigrolimbata*** Anananthasubramanian, 1981

Distribution : India : Karnataka (Coorg)

Genus ***Kanada*** Distant,

47. ***Kanada irvinei*** Distant, 1908

Distribution : India : Bihar (Ranchi), Karnataka (Coorg)

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Fauna of Karnataka, State Fauna Series, **21** : 133-162, 2013

INSECTA : HEMIPTERA (AQUATIC AND SEMI-AQUATIC)

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INTRODUCTION

Hemiptera Infraorders Nepomorpha and Gerromorpha comprises of true aquatic bugs and semi-aquatic bugs respectively, though the former group is having two families namely Gelastocoridae and Ochteridae which are mostly terrestrial yet also found near the edge of fresh water pools. Other major Nepomorphan families are Notonectidae, Corixidae, Belostomatidae, Nepidae and Naucoridae. Typical characteristic feature of Nepomorphy is short antennae which are hidden inside cavities underneath the head. Gerromorpha contains eight families namely Gerridae, Veliidae, Mesoveliidae, Hebridae, Hydrometridae, Macroveliidae, Paraphrynoveliidae and Hermatobatidae (Andersen, 1982) and they are characteriszed by having long conspicuous antennae longer than head and inserted in front of eyes and also they are capable of dwelling over the surface of water by having characteristic modified leg structures.

Consolidated informations on the water bugs from different parts of India pertains to work of Thirumalai (1983-2006), Polhemus *et al.* (1990), Bal and Basu (1994-2009), Ramakrishna (2000), Papacek and Zettel (2001), Ravishankar and Venkitesan (1988), Thirumalai and Raghunathan (1988), Thirumalai and Radhakrishnan (1999), Thirumalai and Krishnan (2000), Thirumalai and Sharma (2000-2005), Thirumalai and Shureshkumar (2005-2006), Zettel and Thirumalai (2001) and Zettel (1977, 1998, 2000, 2001).

The present studies on the water bugs fauna of the state of Karnataka is aimed to give a consolidated taxonomic - cum - faunal account of the conserned group since there was not much knowledge on these important insects from the state.

In the present work total 78 species under 42 genera of 11 families of water bugs (aquatic and semi-aquatic forms) have been recorded. Out of these 11 species have been reported for the first time from the state of Karnataka , which are denoted with asteric marks in the text. The species with material examined have been collected from Karnataka Survey during 1999-2003 made by the survey parties of the Southern Regional Centre, Chennai, of the Zoological Survey of India.

For a good number of species the materials were not available for studies but have been included in the present water- bug fauna as they were recorded earlier by different workers. Taxonomic references on homonyms, synonyms, distribution in India and abroad have been cited in the present water- bug Fauna of Karnataka. The diagnostic characters have been given to those species only for which the specimens were available for the present studies.

SYSTEMATIC LIST

Order HEMIPTERA

Suborder HETEROPTERA

Infraorder GERROMORPHA

Family GERRIDAE

Subfamily CYLINDROSTETHINAE

Genus ***Cylindrostethus*** Mayr, 1865

1. *Cylindrostethos productus* (Spinola, 1840)

Subfamily EOTRECHINAE

Genus ***Onychotrechus*** Kirkaldy, 1903

2. *Onychotrechus rhexenor* Kirkaldy, 1903
3. *Onychotrechus rupestris* Andersen, 1980
4. *Oncyhotrechus spinifer* Andersen, 1980

Genus ***Amemboa*** Esasi, 1925

Subgenus *Amemboa* Esaki, 1925 5. *Amemboa (Amemboa) kumari* (Distant, 1910)

Subgenus *Amemboides* Polhemus &Andersen, 1984

6. *Amemboa (Amemboides) perlata* Polhemus & Andersen, 1984

Genus ***Tarsotrechus*** Andersen, 1980

7. *Tarsotrechus polhemi* Andersen, 1980

Subfamily GERRINAE

Genus ***Aquarius*** Schellenberg, 1800

8. *Aquarius adelaidis* (Dohrn, 1860)

Genus ***Limnogonus*** Stål, 1868

Subgenus *Limnogonus* Stål, 1868

9. *Limnogonus (Limnogonus) fossarum fossarum* (Fabricius, 1775)
10. *Limnogonus (Limnogonus) nitidus* (Mayr, 1865)

Subgenus *Limnogonoides* Poisson, 1965

11. *Limnogonus (Limnogonoides) pectoralis* (Mayr, 1865)

Genus ***Limnometra*** Mayr, 1865

12. *Limnometra anadyomene* (Kirkaldy,1901)
13. *Limnometra fluviorum* (Fabricius, 1798)

Genus ***Neogerris*** Matsumura, 1913

14. *Neogerris parvula* (Stål, 1859) *

Genus ***Tenagogonus*** Stål, 1854

15. *Tenagogonus ceylonensis* Hungerford & Matsuda, 1962

Subfamily HALOBATINAE

Genus ***Metrocoris*** Mayr, 1865

16. *Metrocoris communis* (Distant, 1910)
17. *Metrocoris indicus* Chen & Nieser, 1993
18. *Metrocoris malabaricus* Thirumalai, 1986
19. *Metrocoris variegans* Thirumalai, 1986

Genus ***Ventidius*** Distant, 1910

Subgenus *Ventidius* Distant, 1910

20. *Ventidius (Ventidius) aquarius* Distant, 1910

Subfamily PTILOMERINAE

Genus ***Jucundus*** Distant, 1910

21. *Jucundus custodiendus* Distant, 1910

Genus ***Ptilomera*** Amyot & Serville, 1843

Subgenus *Ptilomera* Amyot & Serville, 1843

22. *Ptilomera (Ptilomera) agroides* Schmidt, 1926

Genus ***Stridulobates*** Zettel & Thirumalai, 2001

23. *Stridulobates anderseni* Zettel & Thirumalai, 2001
24. *Stridulobates nostras* (Thirumalai, 1986)

Subfamily RHAGADOTARSINAE

Genus ***Rhagadotarsus*** Breddin, 1905

Subgenus Rhagadotarsus Breddin, 1905

25. *Rhagadotarsus (Rhagadotarsus) kraepelini* Breddin, 1905

Subfamily TREPOBATINAE

Genus ***Gnomobates*** Polhemus & Polhemus, 1995a.

26. *Gnomobates kuiterti* (Hungerford & Matsuda, 1958)

Genus ***Lathriobates*** Polhemus, 2004

27. *Lathriobates raja* (Distant, 1910) *

Genus ***Naboandelus*** Distant, 1910

28. *Naboandelus signatus* Distant, 1910

Genus ***Ventidius*** Distant, 1910

Subgenus *Ventidius* Distant, 1910

29. *Ventidius (Ventidius) aquarius* Distant, 1910

Family VELIIDAE

Subfamily MICROVELIINAE

Genus ***Baptisa*** Distant, 1903

30. *Baptisa angulata* Andersen, 1989

Genus ***Microvelia*** Westwood, 1834

Subgenus *Microvelia* Westwood, 1834

31. *Microvelia (Microvelia) diluta* Distant, 1909 *

32. *Microvelia (Microvelia) douglasi* Scott, 1874

Genus ***Pseudovelia*** Hoberlandt, 1950

Subgenus *Pseudovelia* Hoberlandt, 1950

33. *Pseudovelia (Pseudovelia) sexualis* (Paiva, 1917)

Subfamily RHAGOVELIINAE

Genus ***Rhagovelia*** Mayr, 1865

Subgenus *Rhagovelia* Mayr, 1865

34. *Rhagovelia (Rhagovelia) tibialis* Lundblad, 1936

Genus ***Tetraripis*** Lundblad, 1936

35. *Tetraripis asymmetricus* Polhemus & Karunaratne, 1979

Family HEBRIDAE

Subfamily HEBRINAE

Genus *Neotimasius* Andersen, 1981

36. *Neotimasius orientalis* Andersen, 1981

Genus ***Timasius*** Distant, 1909

37. *Timasius splendens* Distant, 1909

Family MESOVELIIDAE

Subfamily MESOVELIINAE

Genus ***Mesovelia*** Mulsant & Rey, 1852

38. *Mesovelia vittigera* Horvath, 1895

Family HYDROMETRIDAE

Subfamily HYDROMETRINAE

Genus ***Hydrometra*** Latreille, 1796

39. *Hydrometra butleri* Hungerford and Evans, 1934

40. *Hydrometra greeni* Kirkaldy, 1898

Infraorder NEPOMORPHA

Family NOTONECTIDAE

Subfamily ANISOPINAE

Genus ***Anisops*** Spinola, 1837

41. *Anisops barbatus* Brooks, 1951

42. *Anisops bouvieri* Kirkaldy, 1904

43. *Anisops campbelli* Brooks, 1951

44. *Anisops cavifrons* Brooks, 1951

45. *Anisops nigrolineatus* Lundblad, 1933

46. *Anisops paranigrolineatus* Brooks, 1951 *

47. *Anisops nivea* (Fabricius, 1775) *

48. *Anisops sardeus* Herrich - Shaffer, 1850

49. *Anisops waltairensis* Brooks, 1951 *

Subfamily NOTONECTINAE Latreille, 1802

Tribe **Notonectini** Latreille, 1802

Genus ***Enithares*** Spinola, 1837

50. *Enithares ciliata* (Fabricius, 1798)

51. *Enithares hungerfordi* Brooks, 1948

52. *Enithares fusca* Brooks, 1948

Family NEPIDAE

Subfamily RANATRINAE

Tribe **Ranatrini**

Genus ***Cercotmetus*** Amyot & Serville, 1843

53. *Cercotmetus fumosus* Distant, 1904 *

54. *Cercotmetus pilipes* (Dallas, 1850)

Genus ***Ranatra*** Fabricius, 1790

55. *Ranatra elongata* Fabricius, 1790

56. *Ranatra filiformis* Fabricius, 1790

57. *Ranatra varipes varipes* Stål, 1861 *

Subfamily NEPINAE

Tribe **Nepini**

Genus ***Laccotrephes*** Stål, 1866

58. *Laccotrephes griseus* (Guerin-Meneville, 1835)

59. *Laccotrephes ruber* (Linnaeus, 1764)

Family BELOSTOMATIDAE

Subfamily BELOSTOMATINAE

Genus ***Diplonychus*** Laporte, 1833

60. *Diplonychus rusticus* (Fabricius, 1781)

Subfamily LETHOCERINAE

Genus ***Lethocerus*** Mayr, 1853

Subgenus ***Lethocerus*** Mayr, 1853

61. *Lethocerus (Lethocerus) indicus* (Lepeletiler & Serville, 1825)

Family PLEIDAE

Genus ***Paraplea*** Esaki & China, 1928

62. *Praplea frontalis* (Fieber , 1844)

Family NAUCORIDAE

Subfamily LACCOCORINAE

Genus ***Heleocoris*** Stal, 1876

63. *Heleocoris bergrothi* Montandon, 1897

Family HELOTREPHIDAE

Subfamily HELOTREPHINAE

Tribe **Limnotrephini**

Genus ***Limnotrephes*** Esaki & China, 1928

64. *Limnotrephes campbelli* Esaki & China, 1928

Family CORIXIDAE

Subfamily CORIXINAE

Tribe **Agraptocorixini**

Genus ***Agraptocorixa*** Kirkaldy, 1898

65. *Agraptocorixa hyalinipennis hyalinipennis* (Fabricius, 1803)

Tribe **Corixini**

Genus ***Sigara*** Fabricius, 1775

Subgenus *Tropocorixa* Hutchinson, 1940

66. *Sigara (Tropocorixa) graveleyi* (Hutchinson, 1940) *

67. *Sigara (Tropocorixa) horana* (Hutchinson, 1940) *

68. *Sigara (Tropocorixa) promontoria* Distant,1910

69. *Sigara (Tropocorixa) pruthiana* (Hutchinson,1940)

Subfamily CYMATINAE

Genus ***Cymatia*** Flor, 1860

70. *Cymatia apparens* (Distant , 1910)

Subfamily MICRONECTINAE

Genus ***Micronecta*** Kirkaldy, 1897

Subgenus *Basilonecta* Hutchinson, 1940

71. *Micronecta (Basilonecta) scutellaris scutellaris* (Stal, 1858)

72. *Micronecta (Basilonecta) siva* (Kirkaldy, 1897)

Subgenus *Dichaetonecta* Hutchinson,1940

73. *Micronecta (Dichaetonecta) desertana dravida* Hutchinson, 1940

74. *Micronecta(Dichaetonecta) flavens* Wroblewski, 1960 *

75. *Micronecta (Dichaetonecta) prashadana* Hutchinson, 1940

76. *Micronecta (Dichaetonecta) sanctaecatherine* Hutchinson,1940

Subgenus *Indonectella* Hutchinson, 1940

77. *Micronecta (Indonectella) grisea* (Fieber, 1844)

Subgenus *Sigmonecta* Wroblewski, 1962

78. *Micronecta (Sigmonecta) quadristrigata* Breddin, 1905

Note : Species with asteric marks have been denoted as new record from the State of Karnataka.

SYSTEMATIC ACCOUNT

Order HEMIPTERA

Suborder HETEROPTERA

Infraorder GERROMORPHA

Family GERRIDAE

Subfamily CYLINDROSTETHINAE

Genus ***Cylindrostethus*** Mayr, 1865

1. ***Cylindrostethus productus*** (Spinola, 1840)

1840. *Gerris productus* Spinola, *Essai Sur less insectes hemipteres rhynchotes on heteropteres*, 64.

1903a. *Cylindrostethus productus* (Spinola): Distant, *.Fauna British India*, **2**: 184.

1910a . *Janias elegantulus*: Distant,. *Ann.Mag.nat.Hist.* **5**(8):145.

1994. *Cylindrostethus productus* (Spinola): Polhemus,. *Bishop Mus. Occ.Pap.*, **38**: 10.

2002. *Cylindrostethus productus* (Spinola): Thirumalai,. *Rec. zool. Surv. India*, **100** (1-2): 58.

2006. *Cylindrostethus productus* (Spinola): Thirumalai & Suresh Kumar, *Zool. Surv .India Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series*, **27**: 73.

2007. *Cylindrostethus productus* (Spinola): Thirumalai and Valarmathi, *Zool. Surv. India. Fauna of Bannerghatta National Park, Conservation Area Series* **33**:57.

Diagnosis: This species is very large (more than 25 mm), elongate, dark, which can be recognised by its large connexival spines. *C.productus* is the only member of the genus so far known from India. This species has been found inhabiting smooth flowing mountain streams.

Material Examined: 7♂, 4♀ from Budipaduga, 18.ii.1999, Coll. S. Krishnan; 1♂ (winged) from Muthyala maduvu, 15-ix-2003, Coll: G. Thirumalai.

Distribution: INDIA: Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, UttarPradesh, West Bengal. SRILANKA

Subfamily EOTRECHINAE

Genus ***Onychotrechus*** Kirkaldy, 1903

2. ***Onychotrechus rhexenor*** Kirkaldy, 1903

1903. *Onychotrechus rhexenor* Kirkaldy, *Entomologist*, **36**: 44.

1980. *Onychotrechus rhexenor* Kirkaldy: Andersen, *Steenstrupia*, **6**(10):128.

2002. *Onychothrechus rhexenor* Kirkaldy: Thirumalai, *Rec. zool. Surv. India*, **100**(1-2): 60.

2006. *Onychothrechus rhexenor* Kirkaldy: Thirumalai and Sureshkumar, *Zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series*, **27**: 73

Diagnosis: Darker brown or black in colour; short brown sublateral stripes on mesonotum in wingless forms; male front femur tapering towards apex, elongate patch of dark spinules on inner surface.

Material examined: 1♂ (w) from Basavanagodu, 3. iv. 1999, Coll. G. Thirumalai, 1♂ (w) from Dodithagadu, 5.iv.1999, Coll. G. Thirumalai and 1♂ (w) from Sebinakare to Duraisanialla, 27.ii.2000, Coll. G. Thirumalai.

Distribution: INDIA: Karnataka, Kerala, Maharashtra, Rajasthan, Tamilnadu. AFRICA.

Remarks: O.rhexenor lives on inclined rock faces close to mountain streams, rock splashed by waterfalls and similar habitats.

3. ***Onychotrechus rupestris*** Andersen, 1980

1980. *Onychotrechus rupestris* Andersen, *Steenstrupia*, **6**(10): 132.

2002. *Onychotrechus rupestris*: Thirumalai, *Rec. zool. Surv. India*, **100** (1-2) : 60.

Material examined: Nil

Distribution: INDIA: Karnataka.

4. ***Oncyhotrechus spinifer*** Andersen, 1980

1980. *Onychotrechus spinifer* Andersen, *Steenstrupia*, **6**(10):138.

Material examined: Nil

Distribution: INDIA: Karnataka, Kerala, Maharashtra.

Genus ***Amemboa*** Esasi, 1925

Subgenus *Amemboa* Esaki, 1925

5. ***Amemboa (Amemboa) kumari*** (Distant, 1910)

1910. *Onychotrechus kumari* Distant, *Ann. Mag. nat. Hist.*, **5**: 145

1984. *Amemboa (Amemboa) kumari* (Distant): Polhemus & Andersen, *Steenstrupia*, **10**(3): 85.

2002. *Amemboa (Amemboa) kumari* (Distant): Thirumalai, *Rec. zool. Surv. India*, **100**(1-2): 58.

1950. *Amemboa pervati* : Pradhan, *Rec. Indian Mus.*, **48** (3&4): 12.

2006. *Amemboa (Amemboa) kumari* (Distant): Thirumalai and Suresh Kumar, *Zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series*, **27**: 74

Diagnosis: The male forefemur relatively slender, with two separate hair tufts beyond middle, the basal hair tuft small and pointed. The females cannot safely be identified without the associated males.

Material Examined: 1♂ (apt.), 1 Is from Sebinakare to Doraisanihalla, 27.ii.1999, Coll. G. Thirumalai; 2♂, 3♀ (apt.) from Basavanagodu, 3.iv.1999, Coll. G. Thirumalai and 1♂, 1♀ (apt.) from the road to Sebinakare, 4.iv.1999, Coll. G. Thirumalai.

Distribution: INDIA: Karnataka, Kerala, Orissa, Tamilnadu.

Remarks: This species is reported to occur in small pools, puddles near the streambeds, or on riverbanks. It has not been so far recorded outside the Indian Peninsula.

Subgenus ***Amemboides*** Polhemus & Andersen, 1984

6. ***Amemboa (Amemboides) perlata*** Polhemus & Andersen, 1984

1984. *Amemboa (Amemboides) perlata* Polhemus & Andersen, *Steenstrupia,* **10**(3):100.

Material examined: Nil

Distribution: INDIA**:** Karnataka.

Genus ***Tarsotrechus*** Andersen, 1980

7. ***Tarsotrechus polhemi*** Andersen, 1980

1980. *Tarsotrechus polhemi* Andersen, *Steenstrupia,* **6**(10):143

Material examined: Nil

Distribution: INDIA**:** : Karnataka, Kerala

Subfamily GERRINAE

Genus ***Aquarius*** Schellenberg, 1800

8. ***Aquarius adelaidis*** (Dohrn, 1860)

1860. *Aquarius adelaidis* Dohrn, *Stettin.ent.Ztg.* **21**: 408.

1896. *Gerris spinolae* Leth. & Ser., *Cat.gen.Hemiptera,* **3**: 63.

1903. *Gerris spinolae* Leth. & Ser.: Distant, *Fauna British India*, **2**:180.

1990. *Aquarius adelaidis* (Dohrn): Andersen, *Steenstrupia,* **16**(4): 61.

2002. *Aquarius adelaidis* (Dohrn): Thirumalai, *Rec. zool. Surv. India*, **100** (1-2): 60.

2007. *Aquarius adelaidis* (Dohrn): Thirumalai and Valarmathi, *Zool. Surv. India. Fauna of Bannerghatta National Park, Conservation Area Series,* **33**:57.

Diagnosis: The first antennal segment is the longest, the head, rostrum, pronotum and forelegs are black. The hind margin of pronotum is brownish yellow; forewing dark brown in macropterous forms with dark brownish veins; the hind margin of the 7th sternum with a large triangular impression in middle. This is one of the very common species inhabiting the permanent waterbodies in India, with both macropterous and apterous forms. This species is found in all lentic habitats and also recorded from deep wells in Southern India.

Material examined: 1♀ (winged) from Swarnamugi Beat (Ramasamy Pond), 13-ix-2003, Coll: G. Thirumalai.

Distribution: INDIA: Andhra Pradesh, Bihar, Karnataka, Kerala, Maharashtra, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal. BANGLADESH; CHINA; INDONESIA; MYANMAR; NEPAL; PHILIPPINES; SRILANKA; THIALAND; VIETNAM.

Genus ***Limnogonus*** Stål, 1868

Subgenus ***Limnogonus*** Stål, 1868

9. ***Limnogonus (Limnogonus) fossarum fossarum*** (Fabricius, 1775)

1775. *Cimex fossarum* Fabricius, *Syst. Ent.*, 727.

1794. *Gerris fossarum* Fabricius, *Ent. Syst. emen. aucta,* **IV**:188.

1868. *Limnogonus fossarum* Stål, *K.Svenska Vetensk. Akad.,* **7**: 133.

1959. *Limnogonus (Limnogonus) fossarum (Fab.,)* : Hungerford & Matsuda, *J. Kans. Ent. Soc.,* **32**(1) : 40.

1975. *Limnogonus (Limnogonus) fossarum(Fab.,)*: Andersen, *Ent.Scand.Suppl.,***7**:30.

Material Examined: Nil

Distribution: INDIA: Andaman and Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Delhi, Goa, Haryana, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Pondicherry, Rajasthan, Tamil Nadu, West Bengal. CHINA, JAVA, MALACCA ISLANDS, PHILIPPINES, SUMATRA, TAIWAN, THIALAND, VEITNAM.

10. ***Limnogonus (Limnogonus) nitidus*** (Mayr, 1865)

1865. *Hydrometra nitida* Mayr, *Verh.zool.-bot.Ges.Wien*, **15**: 443.

1903. *Gerris nitida* (Mayr) : Distant, *Fauna British India*, **2**:178.

1908. *Limnogonus nitidus* (Mayr,): Kirkaldy, *Wissenschaf Ergebn. der Schwed. Zool. Exped. nach dem Kilimandjaro*, **12**: 21.

2002. *Limnogonus (Limnogonus) nitidus* (Mayr): Thirumalai, *Rec. zool. Surv. India*, **100** (1-2): 62.

2006. *Limnogonus (Limnogonus) nitidus* (Mayr): Thirumalai and Suresh Kumar, *Zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series*, **27**: 74.

Diagnosis: This species has been recorded from temporary pools, rice fields, ponds from sea level to 1000 metres and found as winged individuals. This can be identified from all the known species of this genus by the presence of fairly, prominent connexival spines and yellow markings at the anterior pronotal lobe.

Material Examined: 1♂ (w) from Road to Sebinakare, 4.iv.1999, Coll. G. Thirumalai.

Distribution: INDIA: Andaman & Nicobar Islands, Arunachal Pradesh, Assam, Bihar, Chandigarh, Delhi, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Orissa,Rajasthan, Tamilnadu, Tripura, Uttar Pradesh, West Bengal. INDONESIA; MALAYSIA; MALDIVE ISLANDS; MYANMAR; NEPAL; SINGAPORE; SRILANKA; THAILAND; VIETNAM.

Subgenus *Limnogonoides* Poisson, 1965

11. ***Limnogonus (Limnogonoides) pectoralis*** (Mayr, 1865)

1865. *Hydrometra pectoralis* Mayr, *Verh. zool. bot. Ges. Wien*, **15**: 443.

1903. *Gerris pectoralis* (Mayr): Distant, *Fauna British India*, **2**: 181

1975. *Limnogonus (Limnogonoides) pectoralis* (Mayr) : Andersen, *Ent. Scand. Suppl.*, **7**: 69.

Material examined: Nil

Distribution: INDIA: Karnataka.

Genus ***Limnometra*** Mayr, 1865

12. ***Limnometra anadyomene*** (Kirkaldy, 1901)

1901. Gerris anadyomene *Kirkaldy*, Entomologist, **34**: 117.

1915. *Tenagogonus anadyomene* (Kirkaldy): Bergroth, *Zool. Meded. Leiden*, **1(2)**:122.

1934. *Limnometra anadyomene* (Kirkaldy): Lundblad, *Arch. Hydrobiol. Suppl.*, **12** : 371.

1960. *Tenagogonus (Limnometra) anadyomene* (Kirkaldy): Matsuda, *Kans. Univ. Sci. Bull.*, **41**: 206.

1995. *Limnometra anadyomene* (Kirkaldy): Andersen, *Steenstrupia*, **21**:117.

1986. *Tenagogonus(Limnometra) longispinulus* (Kirkaldy): Thirumalai, *Rec. zool. Surv. India*, **84** (1-4): 11.

2002. *Limnometra anadyomene* (Kirkaldy): Thirumalai, *Rec. zool. Surv. India*, **100** (1-2): 63.

2006. *Limnometra anadyomene* (Kirkaldy): Thirumalai and Suresh Kumar, *Zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series*, **27**: 75.

Diagnosis: This species can be easily identified by the second tarsal segment of front leg longer than first, middle femur longer than the total body in male and about equal in female; the abdominal connexival spines in males surpassing the first genital segment and not the abdominal tip and never do so in females. It is interesting to note that in this species, females are strikingly broader and larger than males. Its habitat is highly restricted to forest streams.

Material examined: 1♂, 4♀ (apt) and 1♀ (M) from Kalani road, 2.iv.1999, Coll. G. Thirumalai.

Distribution: INDIA: Karnataka, Kerala, Tamilnadu. BORNEO; BURMA; MALAYA; PHILLIPINE ISLANDS; SRI LANKA; SUMATRA.

13. ***Limnometra fluviorum*** (Fabricius, 1798)

1798. *Cimex fluviorum* Fabricius, *Ent. Syst. Suppl.*, 543.

1903. *Gerris fluviorum* (Fabricius): Distant, *Fauna British India*, **2**: 177

1903. *Gerris armata* Spinola: Distant, *Fauna British India*, **2**:180.

1958. *Limnometra fluviorum* (Fabricius): Hungerford & Matsuda, *Kans. Univ. Sci.Bull.*, **39**: 401.

1960. *Tenagogonus (Limnometra) fluviorum* (Fab.): Matsuda, *Kans. Univ. Sci. Bull.,* **41**: 206.

2002. *Limnometra fluviorum* (Fabricius): Thirumalai, *Rec. zool. Surv. India*, **100** (1-2): 63.

2006. *Limnometra fluviorum* (Fabricius): Thirumalai & Suresh Kumar, *Zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 75.

2007. *Limnometra fluviorum* (Fabricius): Thirumalai and Valarmathi, *Zool. Surv. India Fauna of Bannerghatta National Park,, Conservation Area Series,* **33**: 58.

Diagnosis: L. fluviorum can easily be identified by the presence of a spine -like projection on the dorsolateral rear margin of middle coxae. This is a very common species found throughout Southern India and also recorded from a wide variety of freshwater habits.

Material examined: 1♂, 1Is from Kenkare, 25.ii.1999, Coll. S. Krishnan; 1♂ (Macrop) from Doddachempike, 25.ii.1999, Coll. S. Krishnan; 1♀ (winged) from Kombarmathi, 26.ii.1999, coll. S. Krishnan; 2♂ (w) from Kalani road, 2.iv.1999, Coll. G. Thirumalai and 2♂ (w) from Basavanagodu, 3.iv.1999, Coll. G. Thirumalai; 2♂, 1♀ and 1 immature (winged) from Muthyala maduvu, 15-ix-2003, Coll: G. Thirumalai; 8 immature from Athikupae halla, 17-ix-2003, Coll: G. Thirumalai.

Distribution: INDIA: Karnataka, Kerala, Maharashtra, Pondicherry, Tamilnadu, West Bengal. PHILIPPINES; SRILANKA.

Genus ***Neogerris*** Matsumura, 1913

14. ***Neogerris parvula*** (Stål, 1859) *

1859. *Gerris parvula* Stål, *Zoology*, **4**: 265.

1939. *Limnogonus parvulus* (Stål): Hafiz & Riberio, *Rec. Indian Mus.,* **4**: 427.

1959. *L.(Limnogonellus)parvulus* (Stål):Hungerford & Matsuda, *J. Kans. Ent. Soc.,* **32**(1): 41.

1960. *L. (Neogerris) parvulus* (Stål) : Matsuda, *Kans. Univ. Sci. Bull.,* **41** : 114.

1975. *Neogerris parvula* (Stål): Andersen, *Ent. Scand. Suppl.*, **7**: 86.

2002. *Neogerris parvula* (Stål): Thirumalai, *Rec. zool. Surv. India*, **100** (1-2): 63.

1903. *G. tristan* Kirkaldy : Distant, *Fauna British India*, **2**: 179.

2006. *Neogerris parvula* (Stål): Thirumalai and Suresh Kumar, *Rec. zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 76.

Diagnosis: N. parvula is easily separated from all the known species of this genus by the presence of a large round or quadrangular yellow spot on the pronotum. This gerrids enjoy a distribution from the Eastern parts of the Arabian Peninsula to Solomon Island and from Rynku Islands to Java. A very common species found in slow running streams, reservoirs, ponds and rain-fed pools, throughout Indian subcontinent.

Material examined: 1♀ (w) from Basavanagodu, 3.iv.1999, Coll. G. Thirumalai

Distribution: INDIA: Arunachal Pradesh, Assam, Karnataka, Kerala, Orissa, Pondicherry, Tamilnadu, Uttar Pradesh, West Bengal. CHINA; INDONESIA; IRAN; JAPAN; MALAYSIA; MYANMAR; NEW GUINEA; OMAN; PHILIPPINES; PAKISTAN; SOLOMON ISLAND; SRI LANKA; TAIWAN; THAILAND; VIETNAM.

Remarks : Reported this species for the first time from the state.

Genus ***Tenagogonus*** Stål, 1854

15. ***Tenagogonus ceylonensis*** Hungerford & Matsuda, 1962

1962. *Tenagogonus ceylonensis* Hungerford & Matsuda, *Bull. Brooklyn ent. Soc.,* **57**: 141.

Material Examined: Nil.

Distribution: INDIA: Karnataka. SRILANKA.

Subfamily HALOBATINAE

Genus ***Metrocoris*** Mayr, 1865

16. ***Metrocoris communis*** (Distant, 1910)

1910. *Euodus communis* Distant, *Ann. Mag. nat. Hist.*, **5**(8):151.

1929. *Metrocoris communis* (Distant): Esaki, *Ann. Mag. nat. Hist. Soc.,* **4**(10): 419.

1965. *Metrocoris communis* (Distant) : Den Boer, *Zool. Verh. Leiden,*. **74**: 13.

1993. *Metrocoris communis* (Distant) : Chen & Nieser, *Steenstrupia,* **19**(2):49.

2002. *Metrocoris communis* (Distant): Thirumalai, *Rec. zool. Surv. India*, **100** (1-2): 65.

2006. *Metrocoris communis* (Distant): Thirumalai & Suresh Kumar, *Zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 77.

2007. *Metrocoris communis* (Distant): Thirumalai and Valarmathi, *Zool. Surv .India, Fauna of Bannerghatta National Park, Conservation Area Series,* **33**: 58.

Diagnosis: A small (4.5 to 5.8 mm) oval, black and yellow water strider with black marking on dorsal side of head and thorax. The pronotum of wingless forms with'T' shaped black pattern and the winged form with a median black longitudinal stripe almost reaching tip with a pair of lateral black stripes on posterior lobe. The 7th ventral segment of female with a tuft of dark brown hairs on either side laterally. *M.communis* found abundant in still or smooth flowing shaded streams, where they stroke and glide across the surface.

Material Examined: 1♀ (Apt.) from Kombarmathi, 26.ii.1999, coll. S. Krishnan; 2♂, 1♀ and 1 Is from Kalani road, 2.iv.1999, Coll. G. Thirumalai; 1♂ and 1 immature from Ebella, Andharakangavalae, 14-ix-2003, Coll: G. Thirumalai; 4♂, 6♀ (apterus) and 15 immature from Muthyala maduvu, 15-ix-2003, Coll: G. Thirumalai; 1♂ winged and 12 immature from Athikuppae halla, 17-ix-2003, Coll: G. Thirumalai.

*Distribution:*INDIA Karnataka, Maharashtra, Tamilnadu, UttarPradesh. AFGHANISTAN; IRAN; IRAQ; OMAN.

17. ***Metrocoris indicus*** Chen & Nieser, 1993

1993. *Metrocoris indicus* Chen & Nieser, *Steenstrupia,* **19**(2): 48.

1903. *Metrocoris Ståli* (Dohrn): Distant, *Fauna British India,***2**: 190.

1965. *Metrocoris Ståli* (Dohrn): Den Boer, *Zool.Verh.Leiden,* **74**: 8.

1994. *Metrocoris Ståli* (Dohrn) : Thirumalai, *Misc. Occ. Pap. Rec. zool. Surv. India,* **165**: 37.

Material Examined: Nil

*Distribution:*INDIA: Karnataka, Kerala, Maharashtra, Tamilnadu.

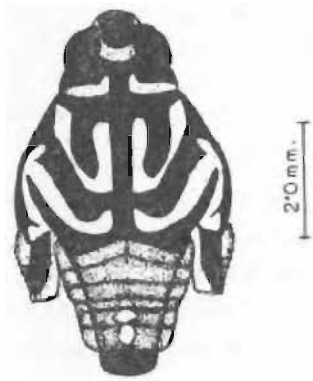
NOTE: Spegimens from Southern India earliar identified as *Metrocoris stali* (Dohrn, 1860) refer to *M.indicus.*

18. ***Metrocoris malabaricus*** Thirumalai, 1986

1986. *Metrocoris malabaricus* Thirumalai, *Rec. zool. Surv. India,* **84**: 22.

2002. *Metrocoris malabaricus* Thirumalai, *Rec. zool. Surv. India*, **100** (1-2): 67.

2006. *Metrocoris malabaricus* Thirumalai: Thirumalai and Suresh Kumar, *Rec. zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 77.



Diagnosis: It can easily be recognised by the thick dark band on dorsal half of mesopleura and thick long velvety pilosity. The slender male femur and prominent falciform paramere which extends beyond genital segments are the other distinguishing characters.

Material examined: 5♂, 6♀ (Apt) from Kadakkinakandi, 21.ii.1999, Coll. S. Krishnan and 1♂, 12♀ from Dodithagadu, 5.iv.1999, Coll. G. Thirumalai.

Distribution: INDIA: Karnataka, Kerala.

19. ***Metrocoris variegans*** Thirumalai, 1986

1986. *Metrocoris variegans* Thirumalai, *Rec. zool. Surv. India,* **84** : 25.

Material examined: Nil

Distribution: INDIA: Karnataka, Kerala.

Genus ***Ventidius*** Distant,1910

Subgenus *Ventidius* Distant, 1910

20. ***Ventidius (Ventidius) aquarius*** Distant, 1910

1910. *Ventidius aquarius* Distant, *Ann. Mag. nat. Hist.,* **5**(8):150.

1960. *Ventidius (Ventidius) aquarius* Distant : Hungerford & Matsuda, *Kans. Univ., Sci. Bull.,* **40** (7): 324.

Material examined: Nil

Distribution: INDIA: Karnataka, Kerala, Tamil Nadu.

Subfamily PTILOMERINAE

Genus ***Jucundus*** Distant, 1910

21. *Jucundus custodiendus* Distant, 1910

1910. *Jucundus costodiendus* Distant, *Ann. Mag. nat. Hist.,* **5**(8):143.

1927. *Rheumatogonus custodiendus* (Distant): Esaki, *Eos Revista Espanola Entomologia,* **3**: 267.

2001. *Jucundus costodiendus* Distant: Zettel & Thirumalai, *Ann. Naturhist. Mus. Wien,* **103B** : 276.

1992. *Pleciobatus tuberculatus* Esaki: Thirumalai, *Hexapoda,* **4:** 173 (male, mis -identification)

Material examined: Nil

Distribution: INDIA: Karnataka, Kerala.

Genus ***Ptilomera*** Amyot & Serville, 1843

Subgenus ***Ptilomera*** Amyot & Serville, 1843

22. ***Ptilomera (Ptilomera) agroides*** Schmidt, 1926

1926. *Ptilomera agroides* Schmidt, *Ent. Mitt.,* **15**(1): 63.

1903. *Ptilomera laticaudata* (Hardwicke): Distant, *Fauna Brit. India,* **2**:185 (Fig:133).

1926. *Ptilomera lachne* Schmidt, *Ent. Mitt.*, **15**(1): 64.

1960. *Ptilomera (Ptilomera) agroides* Schmidt: Matsuda, *Kans. Univ. Sci. Bull.,* **41**(2): 269.

2002. *Ptilomera (Ptilomera) agroides* Schmidt: Thirumalai, *Rec. zool. Surv. India*, **100** (1-2): 69.

2006. *Ptilomera (Ptilomera) agroides* Schmidt: Thirumalai & Suresh Kumar, *Zool. Surv. India Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 77.

2007. *Ptilomera (Ptilomera) agroides* Schmidt: Thirumalai and Valarmathi, *Zool. Surv .India, Fauna of Bannerghatta National Park, Conservation Area Series,* **33**: 71

Diagnosis: The long dorsolateral projection of pygofer, which extends half its length beyond lateral wings of surnal plate as viewed from above, separates this species from all other known species. The distal half of middle femur bears a dense brush of long hairs. The connexival spine of female arising from beneath the connexival edge of the seventh abdominal segment near its base. This species is so far known only from Southern India.

Material Examined: 5♂, 16♀ (apt.), 3 Is from Kadakkina gandi, Bedgudi, 21.ii.1999, Coll. S. Krishnan; 2♂, 3♀ from Girialla, 22.ii.1999, Coll. S. Krishnan; 5♂, 6♀,1 Is from Doddachempike, 25.ii.1999, Coll. S. Krishnan; 1♂,1♀ from Kombarmathi, 26.ii.1999, Coll. S. Krishnan; 2♂,4♀,3Is from Kenkere,1.iii.1999, Coll. S. Krishnan; 1♂,5♀ (apt.) from Basavanagodu, 3.iv.1999, Coll. G. Thirumalai, 3♀ (apt.) from Dodithagadu,5.iv.1999,Coll. G. Thirumalai; 3♂,2♀ (apt.), 2 Is, from Sebinakare to Doraisanihalla, 27.ii.2000, Coll. G. Thirumalai; 3♂,1♀ (apt.) from Biligiri Rangaswamy Temple Hills, 29.ii.2000, Coll. G. Thirumalai; 3♂,3♀ (apt.) from Doddasempige, 2.iii.2000, Coll. G. Thirumalai and 14♂,9♀ from K. Gudi-Sebinakare,7.iv.2000, Coll. S. Krishnan; 1♀ (Apterous) from Muthyala maduvu, 15-ix-2003, Coll: G. Thirumalai.

Distribution: INDIA: Karnataka, Kerala, Maharashtra, Tamilnadu.

Genus ***Stridulobates*** Zettel & Thirumalai, 2001

23. ***Stridulobates anderseni*** Zettel & Thirumalai, 2001

2001. *Stridulobates anderseni* Zettel & Thirumalai, *Insect Syst. Evol.,* **31**(4) : 434.

1992. *Pleciobatus tuberculatus* Esaki: Thirumalai, *Hexapoda,* **4:** 173 (Female, misidentification)

Material Examined: Nil

Distribution: INDIA: Karnataka, Kerala.

24. ***Stridulobates nostras*** (Thirumalai, 1986)

1986. *Pleciobatus nostrus* Thirumalai, *Rec. zool. Surv. India,* **84**(1-4): 19.

2001. *Stridulobates nostras* (Thirumalai): Zettel & Thirumalai, *Insect Syst. Evol.*, **31**(4): 433.

Material Examined: Nil

Distribution: INDIA: Karnataka, Kerala.

Subfamily RHAGADOTARSINAE

Genus ***Rhagadotarsus*** Breddin, 1905

Subgenus ***Rhagadotarsus*** Breddin, 1905

25. ***Rhagadotarsus (Rhagadotarsus) kraepelini*** Breddin, 1905

1905. *Rhagadotarsus karaepelini* Breddin, *Mitt. Nat. Mus.* Hamburg, **22**: 137.

1910. *Nacebus duk* Distant, *Ann. Meg. Nat. Hist.*, **5**: 153.

2002. *Rhagadotarsus karaepelini* Breddin: Thirumalai, *Rec. zool. Surv. India*, **100** (1-2): 70.

2006. *Rhagadotarsus (Rhagadotarsus) karaepelini* Breddin: Thirumalai & Suresh Kumar, *Rec. zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 78.

Diagnosis: The body colour is black. The eighth abdominal segment in males is cylindrical, strongly longitudinally depressed ventrally. The female genitalia is having a well formed saw-like ovipositor. This species is always found on the calm surface of ponds and lakes. Anderson & Foster (1992) has recorded *R. kraepelini* on the surface of sheltered ponds of brackish water in Kerala.

Material examined: 1♂ (apt.), 2 is from Parashukatta, 28.ii.2000, Coll. G. Thirumalai.

Distribution: INDIA: Andhra Pradesh, Arunachal Pradesh, Karnataka, Kerala, Pondicherry, Tamil Nadu, West Bengal. CHINA; INDONESIA; MALAYSIA; MYANMAR.

Subfamily TREPOBATINAE

Genus ***Gnomobates*** Polhemus & Polhemus, 1995a

26. ***Gnomobates kuiterti*** (Hungerford & Matsuda, 1958)

1958. *Cryptobates kuiterti* Hungerford & Matsuda, *J. Kans. Ent. Soc.*, **31**(4): 246.

1995. *Gnomobates kuiterti* (Hungerford & Matsuda): Polhemus & Polhemus, *Ent. Scand.*, **26**(1):108.

2002. *Gnomobates kuiterti* : Thirumalai, *Rec. zool. Surv. India*, **100** (1-2) : 71.

Material examined: Nil

Distribution: INDIA: Karnataka.

Genus ***Lathriobates*** Polhemus, 2004

27. ***Lathriobates raja*** (Distant, 1910) *

1910a . *Gerris raja* Distant,. *Ann. Mag. nat. Hist.*, **5**(8) :142.

1929. *Cryptobatus raja* (Distant): Esaki,. *Ann. Mag. nat. Hist.*, **4**(10): 412.

1995a. *Cryptobatus raja* (Distant) : Polhemus & Polhemus,. *Ent. Scand.*, **26**(1):104.

2002. *Cryptobatus raja* (Distant) : Thirumalai, *Rec. zool. Surv. India*, **100** (1-2): 71.

2004. *Lathriobates raja* (Distant) : Polhemus, *J.N.Y. Entomol. Soc.*, **112**: 212.

2007. *Lathriobates raja* (Distant) : Thirumalai and Valarmathi, *Zool. Surv. India, Fauna of Bannerghatta National Park, Conservation Area Series,* **33**: 59.

Diagnosis: Ground colour yellowish to orange brown; mesosternum without dark streaks laterally; macropterous with long pronotum, broadly rounded posteriorly, with median and lateral broad stripes.

Material Examined: 1♂ (winged) from Athikupae halla, 17-ix-2003, Coll: G. Thirumalai.

Distribution: INDIA : Karnataka, Kerala. SRILANKA.

Remarks : This species is being reported here for the first time from the State.

Genus ***Naboandelus*** Distant, 1910

28. ***Naboandelus signatus*** Distant, 1910

1910. *Naboandelus signatus* Distant, *Ann. Mag. Nat. Hist.*, **5**: 152;

2002. *Naboandelus signatus* Distant: Thirumalai, *Rec. zool. Surv. India*, **100**(1-2): 71.

2006. *Naboandelus signatus* Distant: Thirumalai & Suresh Kumar, *Zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 79.

2007. *Naboandelus signatus* Distant: Thirumalai and Valarmathi, *Zool. Surv. India, Fauna of Bannerghatta National Park, Conservation Area Series,* **33**: 59.

Diagnosis: Body short and somewhat oval. Size of male (apterous) 1.9 to 2.1 mm; female (apterous) 2.1 to 2.4 mm; there is a large black spot surrounded by brownish area on dorsal side of the head; pronotum is with a median yellow spot. Second genital segment with lateral process prominent. This species has been reported from stagnant pond.

Material Examined: 2♂, 3♀ (apt.), 4 Is from Parashukatta, 28.ii.2000, Coll. G. Thirumalai.1♂, 3♀♀ and 1 immature from Ebella, Andharkangavalae, 14-ix-2003, Coll: G. Thirurmalai.

Distribution: INDIA: Karnataka, Pondicherry, Tamil Nadu, Uttar Pradesh, West Bengal.

Genus ***Ventidius*** Distant, 1910

29. ***Ventidius (Ventidius) aquarius*** Distant, 1910

1910. *Ventidius aquarius* Distant, *Ann. Mag. nat. Hist.*, **5**(8):150.

1960. *Ventidius (Ventidius) aquarius* Distant: Hungerford & Matsuda, *Kans. Univ. Sci. Bull.*, **40** (7): 324.

2002. *Ventidius (Ventidius) aquarius* Distant: Thirumalai, *Rec. zool. Surv. India*, **100**(1-2): 67.

2006. *Ventidius (Ventidius) aquarius* Distant: Thirumalai & Suresh Kumar, *Zool. Surv .India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 79.

Diagnosis: Eyes overlapping anteriolateral angles of mesonotum, antennal segments 2nd and 3rd are equal in length, body oval and ochraceous, with 'T' shaped black marking on pronotum in winged form; venter pale brown.

Material examined: 2exs.from Budipaduga, 28.ii.2000, Coll. G. Thirumalai.

Distribution: INDIA: Karnataka, Kerala, Tamil Nadu.

Remarks: This species is commonly found in lotic habitat in the higher ranges of Kerala and Tamil Nadu parts of Western Ghats (altitude between 400-2160m).

Family VELIIDAE

Subfamily MICROVELIINAE

Genus ***Baptisa*** Distant, 1903

30. ***Baptisa angulata*** Andersen, 1989

1989. *Baptisa angulata* Andersen, *Ent. Scand.*, **19**: 373.

2002. *Baptisa angulata* : Thirumalai, *Rec. zool. Surv. India*, **100**(1-2) : 72.

Material examined: Nil

Distribution: INDIA: Karnataka.

Genus ***Microvelia*** Westwood, 1834

Subgenus *Microvelia* Westwood, 1834

31. ***Microvelia (Microvelia) diluta*** Distant, 1909*

1909. *Microvelia diluta* Distant,. *Ann. Mag. nat. Hist.*, **3**(8): 500.

1995. *Microvelia (Microvelia) diluta* Distant : Andersen, *Cat. Het. Palaearctic Region*, **1**: 87.

1989. *Microvelia (M) diluta* Distant : Thirumalai, *Misc. Occ. Pap. Rec. zool. Surv. India,* **118** : 52.

2007. *Microvelia (Microvelia) diluta* Distant: Thirumalai and Valarmathi, *zool. Surv .India, Fauna of Bannerghatta National Park, Conservation Area Series,* **33**: 60.

Diagnosis: This can be readily identified by the presence of tibial comb both in the anterior and middle tibiae in males. The parameres are very rudimentary.

Material Examined: 1♂ from Athikuppae halla, 17-ix-2003, Coll: G. Thirumalai.

Distribution: INDIA: Bihar, Delhi, Karnataka, Maharashtra, Meghalaya, Orissa, Tamil Nadu (Javadi Hills), Tripura, West Bengal. INDONESIA.

Remarks : This species is a new record from the State.

32. ***Microvelia (Picaultia) douglasi*** Scott, 1874

1874. *Microvelia douglasi* Scott, *Ann. Mag. nat. Hist.*, **14**: 448.

1903. *Microvelia repentiana* Distant, *Fauna Brit. India,* **3**: 174.

1909. *M. kumaonensis* Distant, *Ann. Mag. nat. Hist.*, **3**(8): 500

1995. *Microvelia(Microvelia) douglasi* Distant: Andersen, *Cat. Het. Palaearctic Region*, **1**: 87.

2002. *Microvelia (Microvelia) douglasi* Distant: Thirumalai, *Rec. zool. Surv. India*, **100**(1-2): 73.

2003. *Microvelia (Picaultia) douglasi* Scott: Anderson and Weir. Invertebrate Systematic, **17**: 338.

2006. *Microvelia (Picaultia) douglasi* Scott: Thirumalai & Suresh Kumar, *Zool. Surv .India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 79.

2007. *Microvelia (Picaultia) douglasi* Scott: Thirumalai and Valarmathi, *zool. Surv .India, Fauna of Bannerghatta National Park, Conservation Area Series,* **33**: 61.

Diagnosis: Fourth antennal segment longest in males, tibial comb present only in foretibia and the interemedise tibiae distinctly smaller than femora.

Material Examined: 11♂, 9♀ from Road to Sebinakare, 4.iv.1999, Coll. G. Thirumalai; 2♂, 1♀ from Dodithagadu, 5.iv.1999, Coll. G. Thirumalai and 1♀ from Doddasempige, 2.iii.2000, Coll. G. Thirumalai; 4♂(winged) and 4♀ from from Athikuppae halla, 17-ix-2003, Coll: G. Thirumalai; 1♀ and 35 immature from Udugebandae, 11-ix-2003, Coll: G. Thirumalai.

Distribution: INDIA: Andaman and Nicobar Islands, Arunachal Pradesh, Kerala, Karnataka, Maharashtra, Orissa, Tamil Nadu (Javadi Hills), Uttar Pradesh, West Bengal. INDONESIA; JAPAN, SRI LANKA.

Genus ***Pseudovelia*** Hoberlandt, 1950

Subgenus ***Pseudovelia*** Hoberlandt, 1950

33. ***Pseudovelia (Pseudovelia) sexualis*** (Paiva, 1917)

1917. *Micronecta (Kirkaldya) sexualis* Paiva, *Mem. Asiatic Soc. Bengal,* **6** : 77.

1983. *Pseudovelia (Pseudovelia) sexualis* (Paiva) : Andersen, *Ent. Scand.,* **14**: 256.

Material examined: Nil.

Distribution: INDIA: Assam, Karnataka.

Subfamily RHAGOVELIINAE

Genus ***Rhagovelia*** Mayr, 1865

Subgenus ***Rhagovelia*** Mayr, 1865

34. ***Rhagovelia (Rhagovelia) tibialis*** Lundblad, 1936

1936. *Rhagovelia tibialis* Lundblad, *Ark. Zool.,* **28**(21): 31.

1994. *Rhagovelia (Rhagovelia) tibialis* Lundblad: Thirumalai, *Rec. zool. Surv. India,* **94**: 382.

Material examined: Nil.

Distribution: INDIA: Karnataka, Kerala, Tamil Nadu.

Genus ***Tetraripis*** Lundblad, 1936

35. ***Tetraripis asymmetricus*** Polhemus & Karunaratne, 1979

1979. *Tetraripis asymmetricus* Polhemus & Karunaratne, *Bull. Fish. Res. Stn., SriLanka,* **29**: 99.

1996. *Tetraripis asymmetricus* Polhemus & Karunaratne : Thirumalai & Dam, *Hexapoda,* **8**(2): 67.

Material examined: Nil.

Distribution: INDIA: Karnataka, Tamil Nadu.

Family HEBRIDAE

Subfamily HEBRINAE

Genus ***Neotimasius*** Andersen, 1981

36. ***Neotimasius orientalis*** Andersen, 1981

1981. *Neotimasius orientalis* Andersen, *Syst. Entomol.,* **6**: 405.

2002. *Neotimasius orientalis* : Thirumalai, *Rec. zool. Surv. India,* **100** (1-2) : 77.

Material Examined: Nil

Distribution: INDIA: Karnataka, Tamil Nadu.

Genus ***Timasius*** Distant, 1909

37. ***Timasius splendens*** Distant, 1909

1909. *Timasius splendens* Distant, *Ann. Mag. nat. Hist.,* **3**(9): 499.

1981. *Timasius splendens* Distant: Andersen, *Syst. Entomol.,* **6**: 392.

Material examined: Nil

Distribution: INDIA: Karnataka, Tamil Nadu.

Family MESOVELIIDAE

Subfamily MESOVELIINAE

Genus ***Mesovelia*** Mulsant & Rey, 1852

38. ***Mesovelia vittigera*** Horvath, 1895

1895. *Mesovelia vittigera* Horvath, *Rev. Entomologie,* **14:** 160.

1901. *M. orientalis* Kirkaldy, *Ann. Mus. Civ. Genova,* **20**: 808;

1903. *M. mulsanti* White: Distant, *Fauna British India,* **2**: 169

1933. *M. orientalis* Kirkaldy : Lundblad, *Arch. Hydrobiol. Suppl.,* **12**: 186.

1980. *M. vittigera* Horvath : Andersen & Polhemus, *Ent. Scand.,* **11**: 290.

1989. *Mesovelia vittigera* Horvath: Thirumalai, *Misc., Occ., Pap., Rec., zool., Surv. India,* **118**: 35

2002. *Mesovelia vittigera* Horvath : Thirumalai, *Rec. zool. Surv. India*, **100**(1-2) : 79.

2006. *Mesovelia vittigera* Horvath: Thirumalai & Suresh Kumar, *Zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 80.

Diagnosis: The species has a very wide distributional range *viz*., South Europe, Eastern Palaearctic, Ethiopian, Orient, Australia, Oceania, eastward to Samoa Islands. The ventral abdominal segment in males possesses a group of median spines and two sets of brush like hairs laterally. The middle femur in females is spiny below. They prefer stagnant or slow running water covered by emergent or floating vegetation.

Material examined: 1♂, 1♀ from Road to Sebinakare, 4.iv.1999, Coll. G. Thirumalai; 1♂, 1♀ from Dodithagadu, 5.iv.1999, Coll. G. Thirumalai and 4♂ from Doddasempige, 2.iii.2000, Coll. G. Thirumalai.

Distribution: INDIA: Andaman and Nicobar Islands, Arunachal Pradesh, Bihar, Karnataka, Kerala, Maharshtra, Orissa, Pondicherry, Tamil Nadu, Uttar Pradesh, West Bengal. AFRICA; AUSTRALIA; EGYPT; INDONESIA; MALAYSIA; PALESTINE; PHILIPPINES; SYRIA; SAMOA ISLANDS; SRI LANKA.

Family HYDROMETRIDAE

Subfamily HYDROMETRINAE

Genus ***Hydrometra*** Latreille, 1796

39. ***Hydrometra butleri*** Hungerford and Evans, 1934

1934. *Hydrometra butleri* Hungerford and Evans, *Ann. Mag. nat. Hist.,* **28**: 71.

2002. *Hydrometra butleri* Hungerford and Evans: Thirumalai, *Rec. zool. Surv. India*, **100**(1-2): 79.

2006. *Hydrometra butleri* Hungerford and Evans: Thirumalai & Suresh Kumar, *Zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 81.

Diagnosis: It can easily be distinguished by the swollen ventral sixth abdominal segment; a brush or stiff hair extends to the posterior margin in males. The male parameres are symmetrical. The terminal dorsal process is sharp, long and about one half as long as the 6th abdominal segment in both the sexes.

Material examined: 1♂ from Parashukatta, 28.ii.2000, Coll. G. Thirumalai and 1 ♂ from Doddasempige, 2.iii.2000, Coll. G. Thirumalai.

Distribution: INDIA: Karnataka, Kerala, Orissa, Tamilnadu.

40. ***Hydrometra greeni*** Kirkaldy, 1898.

1898. *Hydrometra greeni* Kirkaldy, *Entomologist,* **31** : 2.

1903. *Hydrometra vittata* (Stål): Distant, *Fauna British India,* **2**:170.

2002. *Hydrometra greeni* Kirkaldy : Thirumalai, *Rec. zool. Surv. India*, **100**(1-2): 79.

2006. *Hydrometra greeni* Kirkaldy: Thirumalai & Suresh Kumar, *Zool. Surv .India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 81.

Diagnosis: Anteclypeus conical, seventh abdominal strigite in male with a deep depression, fringed with short stiff hairs. In India this species occurs from near sea level to over 1500 meters elevation. Its habitats include ponds, swampy areas, rocky up and low land streams, lakes, flooded paddy fields.

Material examined: 1♂ from Basavanagodu, 3.iv.1999, Coll. G. Thirumalai and 1♂ from Road to Sebinakare, 4.iv.1999, Coll. G. Thirumalai.

Distribution: INDIA: Andaman & Nicobar Islands, Arunachal Pradesh, Assam, Bihar, Gujarat, Karnataka, Kerala, Maharashtra, Orissa, Pondicherry, Rajasthan, Tamilnadu, Uttar Pradesh, West Bengal. JAPAN; MALAYSIA, MYANMAR, PHILIPPINES, SRI LANKA.

Infraorder NEPOMORPHA

Family NOTONECTIDAE

Subfamily ANISOPINAE

Genus ***Anisops*** Spinola, 1837

41. ***Anisops barbatus*** Brooks, 1951

1951. *Anisops barbata* Brooks, Kan. *Univ. Sci. Bull.*, **34**: 387.

1994. *Anisops barbata* Brooks: Thirumalai, *Misc. Occ. Pap. Rec. zool. Surv. India*, **165**: 13

1995. *Anisops barbatus* Brooks: Polhemus *et al. Cat. Heteroptera Palaearctic region*, **1**: 64.

2004. *Anisops barbatus* Brooks: Thirumalai, *Rec. zool. Surv. India*, **102** (1-2): 65.

2007. *Anisops barbatus* Brooks: Thirumalai and Valarmathi, *zool. Surv .India, Fauna of Bannerghatta National Park, Conservation Area Series,* **33**: 51.

Diagnosis: This species can be easily identified by its large size (over 8.1 mm). It has two tufts of hair on the facial tubercle, asymmetrical male parameres with left paramere showing moderate excavation. The female ovipositor shows a small lateral tooth - like setae near apex and teeth arranged in two longitudinal rows. This species is the largest species of *Anisops* so far reported from India and distributed from plains to the foothills of the Western Himalaya.

Material Examined: 204♂♂ and 211♀♀ from Uchanakente, 18-iii-2004, Coll: K. Rema Devi; 131♂♂ and 63♀♀ from Nachenkere, 22-iii-2004, Coll: K. Rema Devi; 42♂♂ and 18♀♀ from Chickrahalli, 16-iii-2003, Coll: S. Krishnan ; 14♂♂ and 23♀♀ from Thallebande, 24-iii-2004, Coll: K. Rema Devi; 6♂♂ and 15♀♀ from Pillavarathahalli, 12-ix-2003, Coll: G. Thirumalai; 20♂♂ and 14♀♀ from Boothanapalli, 22-iii-2004, Coll: K. Rema Devi; 1♂ and 1♀ from Udigabande, 16-iii-2003, Coll: S. Krishnan .

Distribution: INDIA: Andhra Pradesh, Bihar, Chandigarh, Hriyana, Himachal Pradesh, Karnataka, Madhya Pradesh; Maharashtra, Orissa, Pondicherry, Rajasthan, Tamilnadu, Uttar Pradesh, West Bengal. CHINA; INDONESIA; MALAYASIA; MYANMAR; SRILANKA; TAIWAN, VIETNAM.

42. ***Anisops bouvieri*** Kirkaldy, 1904

1904. *Anisops bouvieri* Kirkaldy, *Wiener Ent. Zeit.*, **23**: 116;

Material Examined: Nil.

Distribution: INDIA: Andaman &Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Pondicherry, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal. BANGLADESH; CHINA; MALAYASIA, MYANMAR, NEW GUINEA, THIALAND.

43. ***Anisops campbelli*** Brooks, 1951

1951. *Anisops campbelli* Brooks, Brooks, *Kans univ. Sci. Bull.*, **34**: 322.

1964. *Anisops campbelli* Brooks: Lansbury, *Ann. zool. Warszawa,* **22**: 213.

2001. *Anisops campbelli* Brooks: Thirumalai, *Fauna conservation area,* **11**: 117.

2004. *Anisops campbelli* Brooks: Thirumalai, *Rec. zool. Surv. India*, **102** (1-2): 65

2007. *Anisops campbelli* Brooks: Thirumalai and Valarmathi, *zool. Surv.India, Fauna of Bannerghatta National Park, Conservation Area Series,* **33**: 51.

Diagnosis: The interocular space in male projects anteriorly into a very short cephalic horn. The parameres are asymmetrical with the left very deeply excavate on the posterior margin. The ovipositor with two rows of longitudinal teeth and seven tooth like lateral setae near apex. It is almost entirely confined to the Indian subcontinent.

Material Examined: 1♂ and 8♀♀ from Uchanakente, 18-iii-2004, Coll: K. Rema Devi; 13♂♂ and 35♀♀ from Nachenkere, 22-iii-2004, Coll: K. Rema Devi; 4♂♂ and 23♀♀ from Chickrahalli, 16-iii-2003, Coll: S. Krishnan; 1♂ and 1♀ from Pillavarathahalli, 12-ix-2003, Coll: G. Thirumalai; 1♂ from Udigabande, 16-iii-2003, Coll: S. Krishnan.

Distribution: INDIA: Chandigarh, Gujarat, Hariyana, Himachal Pradesh, Karnataka, Maharashtra, Punjab, Rajasthan, Tamilnadu, Uttar Pradesh, West Bengal. MYANMAR.

44. *Anisops cavifrons* Brooks, 1951

1951. *Anisops cavifrons* Brooks, *Kans. Univ. Sci. Bull.*, **34**: 418;

1994. *Anisops cavifrons* Brooks: Thirumalai, *Misc. Occ. Pap. Rec. zool. Surv. India,* **165**: 16.

2004. *Anisops cavifrons* Brooks: Thirumalai, *Rec. zool. Surv. India*, **102**(1-2): 65

2007. *Anisops cavifrons* Brooks: Thirumalai and Valarmathi, *Zool. Surv .India, Fauna of Bannerghatta National Park, Conservation Area Series,* **33**: 52.

Diagnosis: A. cavifrons can be distinguished by the presence of a procumbent spine on the fore tibia of male. In males the left paramere is moderately excavate and there are three closely arranged small setae near the base of tarsus. This species has been reported from both Western Ghats and Eastern Ghats and interestingly recorded from Cochin backwaters in Kerala.

Material Examined: 10♂♂ and 13♀♀ from Chickrahalli, 16-iii-2003, Coll: S. Krishnan; 1♂ and 8♀♀ from Pillavarathahalli, 12-ix-2003, Coll: G. Thirumalai; 1♂ and 1♀ from Athikuppehalla, 17-ix-2003, Coll: G. Thirumalai.

Distribution: INDIA: Bihar, Chandigarh, Gujarat, Himachal Pradesh, Karnataka, Kerala, MadhyaPradesh, Maharashtra, Pondicherry, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal. PAKISTAN.

45. *Anisops nigrolineatus* Lundblad, 1933

1933. *Anisops nigrolineata* Lundblad, *Arch. Hydrobiol. Suppl.*, **12**: 160.

1995. *Anisops nigrolineatus* Lundblad: Polhemus, *Cat.Het.Palaerctic region,* **1**: 65.

Material Examined: Nil

Distribution: INDIA: Arunachal Pradesh, Assam, Bihar, Chandigarh, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Punjab, Tamilnadu, Uttar Pradesh, West Bengal. AFGANISTHAN; MYANMAR; BANGLADESH; INDONESIA.

46. *Anisops paranigrolineatus* Brooks, 1951*

1951. *Anisops paranigrolineata*, Brooks, *Kans. Univ. Sci. Bull.*, **34**: 407

2001. *Anisops paranigrolineata*, Brooks: Thirumalai, ZSI, *Fauna of Conservation Area*, **11**: 117.

2006. *Anisops paranigrolineata*, Brooks: Thirumalai & Suresh Kumar, *Zool. Surv. India , Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 64.

Diagnosis: The interocular space is not swollen, the left paramere in male is little excavate.

Material examined: 1♂,1♀ from Doddachempige, 25.ii.1999, coll. S. Krishnan; 18♂, 17♀ from Kalani road, 2.iv.1999, Coll. G. Thirumalai; 9♂, 10♀ from Sebinakare to Duraisanialla, 27.ii.2000, Coll. G. Thirumalai; 1♂ from Parashukatta, 28.ii.2000, Coll. G. Thirumalai and 14♂, 40♀ from Doddasempige, 2.iii.2000, Coll. G. Thirumalai.

Distribution: INDIA: Karnataka, Kerala, Maharashtra, Tamilnadu, Uttar Pradesh.

Remarks: It is so far known only from India and has a remarkable distribution in being restricted so far to Maharashtra, Tamilnadu and Uttar Pradesh. Present study has revealed a new record of the species from the State.

47. *Anisops nivea* (Fabricius, 1775) *

1775. *Notonecta nivea* Fabricius, *Systema Entomologiae, Flensburgi et Lipsiae,* 690.

1851. *Anisops niveus* (Fabricius): Fieber, *Abhandl. Konigl. bohm. Ges. Wiss.*, **7**: 484.

1928. *Anisops niveus* (Fabricius): Dover, *J. Bombay nat. Hist. Soc.*, **32**: 615.

1934. *Anisops nivea* (Fabricius): Lundblad, *Arch. Hydrobiol. Suppl.*, **12**: 163.

1947. *Anisops Anisops) nivea* (Fabricius): Hafiz & Pradhan,. *Rec. Indian Mus.*, **45**: 353.

1951. *Anisops nivea* (Fabricius): Brooks, *Kans. Univ. Sci. Bull.*, **34**: 373.

1995. *Anisops niveus* (Fabricius): arshney, *Zool. Surv. India, Fauna Western Himalaya,* **1**: 53

2001. *Anisops nivea* (Fabricius): Thirumalai, *Fauna conservation area,* **11**: 117.

2007. *Anisops nivea* (Fabricius): Thirumalai and Valarmathi, *zool. Surv. India, Fauna of Bannerghatta National Park, Conservation Area Series,* **33**: 52.

Diagnosis: Size not more than 6.00 mm; facial tubercle with a triangular excavation bordered on each side by a raised carina in males.

Material examined: 19♂♂ and 39♀♀ from Nachenkere, 22-iii-2004, Coll: K. Rema Devi; 1♂ from Thallebande, 24-iii-2004, Coll: K. Rema Devi; 2♂♂ from Udigabande, 16-iii-2003, Coll: S. Krishnan .

Distribution: INDIA: Andaman & Nicobar Islands, Assam, Bihar, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Tamil Nadu, Uttar Pradesh, West Bengal. SUMATRA.

Remarks : This species is being reported for the first time from the State.

48. ***Anisops sardeus*** Herrich-Shaffer, 1850

1850. *Anisops sardeus* Herrich-Shaffer, *Die wanzenartigen Insecten*, **9**: 41.

1906. *Anisops sardeus* Herrich-Shaffer: Distant, *Fauna British India*, **3**: 45

1918. *Anisops sardeus* Herrich-Shaffer: Pavia, *Rec. Indian Mus.*, **14**: 28

1951. *Anisops sardeus* Herrich-Shaffer: Brooks,. *Univ. Kans. Sci. Bull.*, **34**: 423.

1989. *Anisops sardea* Herrich-Shaffer: Thirumalai, *Misc. Occ. Pap. Rec. zool. Surv. India*, **118**: 26

1995. *Anisops sardeus sardeus* Herrich-Shaffer: Polhemus, *Cat.Het.Palaerctic region*, **1**: 66.

2006. *Anisops sardeus* Herrich-Shaffer: Thirumalai & Suresh Kumar, *Zool. Surv .India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series*, **27**: 64.

2007. *Anisops sardeus* Herrich-Shaffer: Thirumalai and Valarmathi, *zool. Surv. India, Fauna of Bannerghatta National Park, Conservation Area Series*, **33**: 52.

Diagnosis: This is a moderately larger species (more than 7.3 mm) with the male having a cephalic projection, the two basal tibial setae of anterior legs in male spatulate and the left paramere deeply excavate. The ovipositor of female with the longitudinal teeth and lateral tooth-like setae. It has a wide distribution. It is known to occur in Mediterranean countries and Western Asia and widely distributed in Ethiopian, Oriental and southern Palaearctic regions.

Material examined: 1♂, 1♀ from Road to Sebinakare, 4.iv.1999, Coll. G. Thirumalai 7♂♂ and 16♀♀ from Uchanakente, 18-iii-2004, Coll: K. Rema Devi; 130♂♂ and 62♀♀ from Nachenkere, 22-iii-2004, Coll: K. Rema Devi; 273♂♂ and 96♀♀ from Chickrahalli, 16-iii-2003, Coll: S. Krishnan ; 2♂ and 1♀ from Thallebande, 24-iii-2004, Coll: K. Rema Devi; 4♂♂ and 11♀♀ from Pillavarathahalli, 12-ix-2003, Coll: G. Thirumalai; 3♂♂ and 13♀♀ from Boothanapalli, 22-iii-2004, Coll: K. Rema Devi; 2♂♂ and 3♀♀ from Udigabande, 16-iii-2003, Coll: S. Krishnan ; 15♂♂ and 6♀♀ from Athikuppehalla, 17-ix-2003, Coll: G. Thirumalai.

Distribution: INDIA: Andamam & Nicobar Islands, Andhra Pradesh, Bihar, Chandigarh, Delhi, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Orissa, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal. AFGHANISTAN; AFRICA; ALBANIA; CANARY ISLANDS; MYANMAR; SYRIA; TURKEY.

49. ***Anisops waltairensis*** Brooks, 1951*

1951. *Anisops waltairensis* Brooks, *Univ. Kans. Sci. Bull.*, **34**: 457.

1994. *Anisops waltairensis* Brooks: Thirumalai, Misc. *Occ. Pap. Rec. zool. Surv. India*, **165**: 19.

2002. *Anisops waltairensis* Brooks: Thirumalai Metha & Sharma, *Res. Bull. Panjab Univ.*, **52**: 156.

2007. *Anisops waltairensis* Brooks: Thirumalai and Valarmathi, *Zool. Surv. India, Fauna of Bannerghatta National Park, Conservation Area Series*, **33**: 53.

*Diagnosis:*The species has been known only from India. The diagnostic characters comprise of a much narrower synthlipsis, a median raw of small setae on inner surface of anterior tarsi of males of rostral prong that is acuminate at the apex.

Material Examined: 4♂♂ and 2♀♀ from Nachenkere, 22-iii-2004, Coll: K. Rema Devi; 24♂♂ and 50♀♀ from Chickrahalli, 16-iii-2003, Coll: S. Krishnan ; 2♂♂ from Udigabande, 16-iii-2003, Coll: S. Krishnan

Distribution: INDIA: Andhra Pradesh, Chandigarh, Himachal Pradesh, Karnataka, Punjab, Tamil Nadu.

Remarks : Present study has considered this species as a new record from the State.

Subfamily NOTONECTINAE LATREILLE, 1802

Tribe ***Notonectini*** Latreille, 1802

Genus ***Enithares*** Spinola, 1837

50. ***Enithares ciliata*** (Fabricius, 1798)

1798. *Notonecta ciliata* Fabricius, *Suppl. Ent. Syst.*, 524.

1906. *Enithares indica* Spinola: Distant, *Fauna British India*, **3**: 42.

1910. *Enithares paviana* Distant, *Fauna British India,* **5**: 329.

1919. *E. lacta* Paiva, *Rec. Indian Mus.*, **19**: 155.

1938. *E. abbreviata* (Kirby): Hafiz and Mathai, *Rec. Indian Mus.*, **40**: 210.

2006. *Enithares ciliata* (Fabricius): Thirumalai & Suresh Kumar, *Zool. Surv .India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 65.

Diagnosis: The mesotrochanter is rounded with a patch of black spicules along the ventral margin, covering a much larger area. This species, like the other known species of the genus, is found on water surface and usually feeds on prey caught in the surface film or floating at the surface of deep water or clinging to submerged objects.

Material Examined: 1♂ from Kombarmathi, 26.ii.1999, coll. S. Krishnan; 2♂,1♀ from Sebinakare to Duraisanialla, 27.ii.2000, Coll. G. Thirumalai and 12♂,4♀ and 5Is from Doddasempige, 2.iv.2000, Coll. G. Thirumalai.

Distribution: INDIA: Andaman & Nicobar Islands, Andhra Pradesh, Bihar, Goa, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Tamil Nadu, West Bengal. BHUTAN; INDONESIA, MALAYASIA, MAURITIUS, SRI LANKA, VEITNAM.

51. ***Enithares hungerfordi*** Brooks, 1948

1941. *Enithares hungerfordi* Brooks, *J. Kans. Ent. Soc.*, **21**: 41

2001. *Enithares hungerfordi* Brooks: Thirumalai, ZSI, *Fauna of Conservation Area,* **11**: 115.

2006. *Enithares hungerfordi* Brooks: Thirumalai & Suresh Kumar, *Zool. Surv .India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 65.

Diagnosis: The basal width of the metaxyphus equals the median length. The males of *Enithares hungerfordi* lack a flap on the forefemora near the back of the trochanters.

Material Examined: 1♂ from Girialla, 22.ii.1999, Coll. G. Thirumalai; 4♀ from Doddachempige, 25.ii.1999, coll. S. Krishnan; 1♂,1♀ from Kombarmathi, 26.ii.1999, coll. S. Krishnan; 1♂, 3♀, 1Is from Kenkere, 1.iii.1999, Coll. G. Thirumalai; 8♂,6♀,2 Is from Kalani road, 2.iv.1999, Coll. G. Thirumalai; 2♂, 4♀ from Basavanagodu, 3.iv.1999, Coll. G. Thirumalai; 1♀ from Road to Sebinakare, 4.iv.1999, Coll. G. Thirumalai; 1♀ from Dodithagadu, 5.iv.1999, Coll. G. Thirumalai; 1♂, 4♀, 2 Is from Sebinakare to Duraisanialla, 27.ii.2000, Coll. G. Thirumalai; 3♂, 5♀ from Biligiri Rangaswamy Temple Hills, 29.ii.2000, Coll. G. Thirumalai and 1♂,2♀ from Doddasempige, 2.iii.2000, Coll. G. Thirumalai.

Distribution: INDIA: Karnataka, Kerala, Tamil Nadu, Uttarakhand.

Remarks: Out of the five species so far known from India, *E. hungerfordi* along with *E. fusca* Brooks so far restricted to southern part of India. The distribution records so far revealed that this species has been found in Western and Eastern Ghats.

52. ***Enithares fusca*** Brooks, 1948

1948. *Enithares fusca* Brooks, *J.Kans. Ent. Soc.*, **21:** 46.

1968. *Enithares fusca* Brooks: Lansbury, *Pacif. Insects,* **10:** 412.

2001. *Enithares fusca* Brooks: Thirumalai, *ZSI. Fauna Conservation area,* **11:** 115.

2004. *Enithares fusca* Brooks: Thirumalai, *Rec. zool. Surv. India*, **102** (1-2): 65

2007. *Enithares fusca* Brooks: Thirumalai and Valarmathi, *zool. Surv. India, Fauna of Bannerghatta National Park, Conservation Area Series,* **33**: 50.

Diagnosis: Size more than 9.0 mm (9.1 to 9.45mm); Similar to E. ciliate (Fabricius) in genral and the presence of a large nodule on the inner surface of the mid-tibia distally separate E. fusca from E.ciliata. This species is so far reported only from Kerala and hence the occurrence of this species in the Dharmapuri District of Tamilnadu is an additional interesting record.

Material examined: 2 ♀ from Nachenkere, 22-iii-2004, Coll: K. Rema Devi.

Distribution: INDIA: Kerala, Karnataka, Maharashtra, Tamil Nadu.

Family NEPIDAE

Subfamily RANATRINAE

Tribe **Ranatrini**

Genus ***Cercotmetus*** Amyot & Serville, 1843

53. ***Cercotmetus fumosus*** Distant, 1904 *

1904. *Cercotmetus fumosus* Distant, *Entomologist*, **37**: 278.

2001. *Cercotmetus fumosus* Distant: Thirumalai, ZSI, *Fauna of Conservation Area,* **11**: 118.

2006. *Cercotmetus fumosus* Distant: Thirumalai & Suresh Kumar, *Zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 67.

Diagnosis: Long, 48mm; vertex with prominent tubercle; respiratory siphon two and a half times longer than the operculum; operculum narrow and carinate.

Material Examined: 1 ♀, Road from Parashukatta to Budipaduga, 28,ii, 2000, Coll. G. Thirumalai

Distribution: INDIA: Bihar, Himachal Pradesh, Karnataka, Madhya Pradesh, Punjab, Orissa, Tamil Nadu, Uttar Pradesh. SRI LANKA.

Remarks: Species belonging to this genus are poorly known in India. This species is reported for the first time from the State.

54. ***Cercotmetus pilipes*** (Dallas, 1850)

1850. *Ranatra (Cercotmetus) pilipes* Dallas, *Trans. R. ent. Soc. Lond.*, **1**:9.

1903. *Cercotmetus pilipes* (Dallas): Montandon, *Bull. Soc. ti. Buck.*, **12**: 110.

1997. *Cercotmetus pilipes* (Dallas): Bal & Basu, *Zool. Surv. India, State Fauna*, **6**: 267.

2006. *Cercotmetus pilipes* (Dallas): Thirumalai & Suresh Kumar, *Zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 67.

Diagnosis: Length not more than 40mm; vertex with very distinct tubercle; antennae in male with stout spines sparsely arranged; middle and hind tibia with dense fringes of hairs; mesonotum with carination posteriorly.

Material examined: 1 ♂ from Budipaduga, 18.ii.1999, Coll. S. Krishnan.

Distribution: INDIA: Delhi, Karnataka, Kerala; BHUTAN

Genus ***Ranatra*** Fabricius, 1790

55. ***Ranatra elongata*** Fabricius, 1790

1790. *Ranatra elongata* Fabricius *Skrif. Nat. Selesk.*, **1**: 228.

1906. *Ranatra elongata* Fabricius: Distant, *Fauna Brit. India,* **3**: 18.

1947. *Ranatra elongata* Fabricius: Hafiz & Pradhan, *Rec. Indian Mus.*, **45**: 368.

1972. *Ranatra elongata* Fabricius: Lansbury, *Trans. R. ent. Soc. Lond.*, **124**: 306.

1994. *Ranatra elongata* Fabricius: Thirumalai, *Misc. Occ. Pap. Rec. zool. Surv. India,* **165**: 22.

2001. *Ranatra elongata* Fabricius: Thirumalai, *Fauna Conservation Area,* **11**: 118.

2004. *Ranatra elongata* Fabricius: Thirumalai, *Rec. zool. Surv. India*, **102** (1-2): 66.

2006. *Ranatra elongata* Fabricius: Thirumalai & Suresh Kumar, *Zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 67.

2007. *Ranatra elongata* Fabricius: Thirumalai and Valarmathi, *Zool. Surv .India, Fauna of Bannerghatta National Park, Conservation Area Series,* **33**: 50.

Diagnosis: This genus is cosmopolitan in distribution and contains more than 120 species all over the world. It is reported to be feeding on tadpoles, nymph of mayflies and other aquatic hemipterans and during dry seasons, it is known to migrate in search of suitable areas. This species can

be identified by the structure of the anterior femur, which is provided with a triangular tooth beyond the middle of its length, and the metasternal process, which is sub triangular, and centrally longitudinally foveately sulcate. The forecoxae are two-thirds the length of prothorax and anterior lobe of prothorax less than twice the length of posterior lobe. Large body size (40-60 mm) and the length of the respiratory siphon that is equal or longer than the body can also distinguish this species.

Material Examined: 1♂ from Girialla, 22.ii.1999, Coll. S. Krishnan, 10♂, 8♀ and 3 Is 7km from K. Gudi to Biligiri, 24.ii.1999, Coll. S. Krishnan, 1♀ from Dodithagadu, 5.iv.1999, Coll. S. Krishnan; 1♂ from Parashukatta to Budipaduga, 28.ii.2000, Coll. G. Thirumalai and 1♂,2♀ from Doddasempige,2.iii.2000, Coll. G. Thirumalai; 37♂♂ and 41♀♀ from Thalebande, 24-iii-2004, Coll: K. Rema Devi; 48♂♂ and 39♀♀ from Gullattikere 22-iii-2004, Coll: K. Rema Devi; 31♂♂ and 39♀♀ and 2 immature from Nelgavi, 21-iii-2004, Coll: K. Rema Devi; 15♂♂ and 14♀♀ and 1 immature from Wachenkere, 22-iii-2004, Coll: K. Rema Devi; 5♂♂ and 10♀♀ from Mulegundi, 18-iii-2004, Coll: K. Rema Devi; 1♂ from Horahalli Range, Batanalu, 23-iii-2004, Coll: K. Rema Devi; 2♂♂ from Pillavarathahalli, 12-ix-2003, Coll:G. Thirumalai; 1♂ and 2♀♀ from Uthigabande Dam Site, 18-iii-2004, Coll: K. Rema Devi; 1♂ from Boothana Palli, 22-iii-2004, Coll: K. Rema Devi; 1♂ and 2♀♀ from Madeshpura Koil Kere, 19-iii-2004, Coll: K. Rema Devi. 21♂♂, 28♀♀ and 9 immature from Hosahalli, Mysore, 20.xi.1999, Coll: M. B. Raghunathan; 3♂♂ from Kolarkere (Basavanahale), 13.xii.2001, Coll: M. B. Raghunathan; 1♀ and 4 immature from Ellapallikere, 20.xii.2001. Coll: M. B. Raghunathan; 4♂♂, 1♀ and 7 immature from Haskote, 12.xii.2001, Coll: M. B. Raghunathan; 4♂♂, 3♀♀ and 2 immature from Chikkundi, Mysore, 19.xi.1999, Coll: M. B. Raghunathan; 1♂ and 1 immature from Amman kere, 16-xii-2001, Coll: M. B. Raghunathan; 1♂ and 2♀♀ from Udigabande, Bangalore, Coll: S. Krishnan; 38♂♂ and 16♀♀ from Kollegal Road, Mysore, 24.ii.2000, Coll: G. Thirumalai; 35♂♂, 34♀♀ and 10 immature from Chinnathagudi, Mysore, 17.xi.1999, Coll: M. B. Raghunathan; 1♀ from Amera Hall Kere, 12.xii.2001, Coll: M. B. Raghunathan; 1♀ from Road to Hunchia Subramaniya, Dakshina Kannada, 16.iv.1995, Coll: G. Thirumalai; 1♂ from Kollegal Road, Myosre, 24.ii.2000, Coll: G. Thirumalai; 12♂♂ and 5♀♀ from Road to Chamarajnagar, Mysore, Coll: G. Thirumalai; 36♂♂, 20♀♀ and 9 immature from Hosahalli, Mysore, Coll: M. B. Raghunathan;

Distribution: INDIA: Andhra Pradesh, Arunachal Pradesh, Bihar, Chandigarh, Delhi, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Pondicherry, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal. AUSTRALIA; NEPAL; SRI LANKA.

56. ***Ranatra filiformis*** Fabricius, 1790

1790. *Ranatra filiformis Fabricius, Skrit. Nat. Selsk.,* **1** : 228.

1860. *Ranatra sordidula* Dohrn, *Stett. ent. Zeit.,* **21**: 409 .

1906. *Ranatra filiformis* Fabricius : Distant, *Fauna British India,* **3**: 21.

1906a. *Ranatra sordidula* Dohrn: Distant, *Fauna British India,* **3**: 22.

2001. *Ranatra filiformis* Fabricius: Thirumalai, ZSI, *Fauna of Conservation Area,* **11**: 118.

2006. *Ranatra filiformis* Fabricius: Thirumalai & Suresh Kumar, *Zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 68.

2007. *Ranatra filiformis* Fabricius: Thirumalai and Valarmathi, *Zool. Surv. India, Fauna of Bannerghatta National Park, Conservation Area Series,* **33**: 55.

Diagnosis: The males of this species can be identified by the absence of a tooth and presence of several small spines on the inner margins of distally hook shaped paramere and presence of wide interocular space. This species is smaller in size than *R. elongata.* This species is mostly found among vegetation, fringing the shallower parts of

water, clinging to submerged vegetation and feeds on nymphs of dragonflies and mosquito pupae.

Material examined: 3♀ from Kenkare, 25.ii.1999, Coll. S. Krishnan; 1♂ from BR hills, 1.iii.1999, Coll. S. Krishnan; 7♂, 4♀, 1 Is from Parashukatta to Budipaduga, 28.ii.2000, Coll. G. Thirumalai and 1♂ from Doddasempige, 2.iii.2000, Coll. G. Thirumalai; 3♂♂ and 1immature from Doddnnakere, 17-iii-2004, Coll: K. Rema Devi; 1♀ from Uthigabande Dam Site, 18-iii-2004, Coll: K. Rema Devi; 1♂ from Madeshpura Koil Kere, 19-iii-2004, Coll: K. Rema Devi. 1♂ and 2♀♀ from Kollegal Road, Mysore, 24.ii.2000, Coll: G. Thirumalai; 2♂♂, 6♀♀ and 2 immatures from Nadanahalli, Mysore, 31.iii.2000, Coll: S. Krishnan; 1♂ and 4♀♀ from Amera Hall Kere, 12.xii.2001, Coll: M. B. Raghunathan;

Distribution: INDIA: Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chandigarh, Delhi, Gujarat, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Orissa, Pondicherry, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal. NEPAL; PAKISTAN; PHILIPPINES; SRI LANKA..

57. ***Ranatra varipes varipes*** Stål, 1861 *

1861. *Ranatra varipes* Stål, *Ofvers. K. Vetensk. Akad. Forh.*, **18**: 203;

1972. *Ranatra varipes* Stål: Lansbury, *Trans. R. Ent. Soc. Lond.*, **124**: 316;

1998. *Ranatra varipes varipes* Stål: Nieser & Polhemus, Amemboa, **2**: 22.

2007. *Ranatra varipes varipes* Stål: Thirumalai and Valarmathi, *Zool. Surv. India Fauna of Bannerghatta National Park, Conservation Area Series,* **33**: 55.

Diagnosis: Small body size 20-33 mm; respiratory siphon shorter than body; fore femora are broad with irregular brown markings.

Material Examined: 1♂ from Doddannakere, 17-iii-2004, Coll: K. Rema Devi.

Distribution: INDIA: Bihar, Karnataka, Maharashtra, Manipur, Meghalaya, Orissa, Pondicherry, Tamil Nadu, Uttar Pradesh, West Bengal. AUSTRALIA; INDONESIA; MALAYASIA; MYANMAR; SRI LANKA; TAIWAN; THAILAND.

Remarks: Distribution of this species with a new record from the State.

Subfamily NEPINAE

Tribe **Nepini**

Genus ***Laccotrephes*** Stål, 1866

58. ***Laccotrephes griseus*** (Guerin-Meneville, 1835)

1844. *Nepa griseus* Guerin- Meneville, *Iconoogr. Regne. Anim. Ins.*, 352.

1910. *Laccotrephes griseus* (G-M): Distant, *Fauna British India,* **5**: 314;

1947. *Laccotrephes griseus* (G-M): Hafiz & Pradhan, *Rec. Indian Mus.*, **45**: 363.

2005. *Laccotrephes griseus* (G-M): Thirumalai & Suresh Kumar, *Rec. zool. Surv. India,* **105**: 11.

2006. *Laccotrephes griseus* (G-M): Thirumalai & Suresh Kumar, *Zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 69.

2007. *Laccotrephes griseus* (G-M): Thirumalai and Valarmathi, *Zool. Surv. India Fauna of Bannerghatta National Park, Conservation Area Series,* **33**: 53.

Diagnosis: This species can be identified by the presence of slightly hooked and symmetrical parameres, abdominal appendages shorter than the body, presence of an obtusely rounded tooth at the base of the anterior femora. This species is commonly found in Peninsular India. It is a very sluggish species often found under weeds or at the bottom of slow or stagnant waters.

Material examined: 2♂, 1♀ from Kenkare, 25.ii.1999, Coll. S. Krishnan; 1♂ and 1♀ from Kalani road, 2.iv.1999, Coll. G. Thirumalai; 1♀ Road to Sebinakare, 4.iv.1999, Coll. G. Thirumalai; 1♂, 3♀ from Parashukatta to Budipaduka, 28.ii.2000, Coll. G. Thirumalai and 1♂ from Doddasempige, 2.iii.2000, Coll. G. Thirumalai; 2♀♀ and 1immature from Doddannakere, 17-iii-2004, Coll: K. Rema Devi; 1♂ from Chikkundi,

Mysore, 19.xi.1999, Coll: M. B. Raghunathan; 1♂ from Anjeri, Kollr, Dakshin Kannada, 11.iv.1999, Coll: G. Thirumalai; 1♂ from Road to Mandya, Mandya, 8.iv.2001, Coll: G. Thirumalai; 1♂ and 1♀ from Bevagal, Melkote Wildlife Sanctuary, Mandya, 10.iv.2001, Coll: G. Thirumalai; 1♀ from Road to Hassan (Bhandur), Hassan, 30.iii.2001, Coll: G. Thirumalai;

Distribution: INDIA: : Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chandigarh, Delhi,Gujarat, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Orissa, Pondicherry, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal. MALAYASIA; MYANMAR; SEYCHELLES; SRI LANKA; THAILAND.

59. ***Laccotrephes ruber*** (Linnaeus, 1764)

1764. *Nepa ruber,* Linnaeus, *Mus. Lud. Ulr.* 165.

1906. *Laccotrephes ruber* (Linn.): Distant, *Fauna British India,* **3***:* 18;

1994. *Laccotrephes ruber* (Linn.): Thirumalai, *Misc. Occ. Pap. Rec. Zool. Surv. India,* **165**: 22.

2006. *Laccotrephes ruber* (Linn.): Thirumalai & Suresh Kumar, *Zool. Surv .India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 69.

Diagnosis: This is a common species with wide distribution in the Indo - Australian region and is largely found in habitats like rivers, streams, tanks, etc. The abdominal appendices are distinctly longer than the body, the prosternum is convex in the middle and has a curved and hook shaped male paramere.

Material examined: 1♀ from Kadakkina gandi, Bedgudi, 21.ii.1999, Coll. S. Krishnan; 5♂, 4♀ from Kenkare, 25.ii.1999, Coll. S. Krishnan; 5♂,4♀ from BR hills, 1.iii.1999, Coll. S. Krishnan; 3♂, 1♀ from Basavanagodu, 3. iv. 1999, Coll. G. Thirumalai; 1♀ from Road to Sebinakare, 4.iv.1999, Coll. G. Thirumalai; 4♀ from Seebinakare to Duraisanialla, 27.ii.2000, Coll. G. Thirumalai;1♀ from Biligiri Rangaswamy Temple Hills, 29.ii.2000, Coll. G. Thirumalai and 1♀ from foot hills, K. Gudi, 1.iii.2000, Coll. G. Thirumalai. 1♂ and 1♀ from Chikkundi, Mysore, 19.xi.1999, Coll: M. B.

Raghunathan; 1 ♂ and 6♀ from Kollegal Road, Mysore, Coll: G. Thirumalai; 1♀ and 1 immature from Road to Bhagamandala Napoklu, 8.iv.1999, Coll: G. Thirumalai; 1 ♂ and 2♀ from Bevagal, Melkote Wildlife Sanctuary, Mandya, 10.iv.2001, Coll: G. Thirumalai; 1 ♂ from Kollegal, Mysore, 26.xi.1999, Coll: M. B. Raghunathan; 1♀ from B. R. Hills, Mysore, 22.xi.1999, Coll: M. B. Raghunathan; 1 ♂ from Kolathuru near Hoskote, 11.xii.2001, Coll: M. B. Raghunathan;

Distribution: INDIA: Arunachal Pradesh, Assam, Bihar, Chandigarh, Delhi, Gujarat, Himachal Pradesh, Jammu and Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Orissa, Tamilnadu, Uttar Pradesh, West Bengal. CHINA; JAPAN; NEPAL; PAKISTAN; TAIWAN.

Family BELOSTOMATIDAE

Subfamily BELOSTOMATINAE

Genus ***Diplonychus*** Laporte, 1833

60. ***Diplonychus rusticus*** (Fabricius, 1781)

1781. *Nepa rustica* Fabricius, *Species insectorum,* **2**: 333.

1776. *Nepa plana* Sulzer, *abgek. Gesch.Insect,* 92.

1863. *Appasus marginicollis* Dufour, *Ann. Soc. Ent. France,* **(4)3**: 393.

1868. *Diplonychus rusticus* (Fab.): Mayr *Zoolog. Teil Wien,*188.

1871. *Diplonychus rusticum* (Fab): Mayr, *Verh.zool.-bot. Ges. Wien*, **21**: 437.

1906. *Sphaerodema rusticum* (Fab.): Distant, *Fauna British India*, **3** : 36.

1915. *Sphaerodema rustica* (Fab): Bergroth, *J. Bombay nat. Hist.*, **24**: 179.

1934. *Diplonychus rusticum* (Fab): Lundblad, *Arch. Hydrobiol. Suppl.*, **12**: 55.

1947. *Diplonychus rusticum* (Fab): Hafiz & Pradhan, *Rec. Indian Mus.*, **45**: 374.

1961. *Diplonychus rusticus* (Fab.): Lauck & Menke, *Ann. Entomol. Soc. Amer.*, **54**: 649.

1980. *Diplonychus indicus* Venkatesan & Rao, *J. Bombay. Nat. Hist. Soc.* **77** : 299.

2005. *Diplonychus rusticus* (Fab.): Thirumalai & Suresh Kumar, *Rec. zool. Surv. India*, **105**: 13.

2007. *Diplonychus rusticus* (Fab.): Thirumalai and Valarmathi, *Zool. Surv. India Fauna of Bannerghatta National Park, Conservation Area Series*, **33**: 56.

Diagnosis: This species has a single segmented fore tarsus with small claw, pale lateral basal margins of pronotum and its head length is shorter than the width between the eyes. This species is commonly found in fishponds and voraciously feeds on fish fry, mosquito larvae and other aquatic organisms.

Material Examined: 23♂♂, 38♀♀ and 12 immature from Doddannakere, 17-iii-2004, Coll: K. Rema Devi; 1♀and 23 immature from Doddannakere, 17-iii-2004, Coll: K. Rema Devi; 1♂ and 2♀♀ from Boothapalli, 22-iii-2004, Coll: K. Rema Devi; 36♂♂, 20♀♀ and 9 immature from Hosahalli, Mysore, Coll: M. B. Raghunathan; 8♂♂, 10♀♀ and 7 immature from Kabini River and around, Mysore Coll: G. Thirumalai; 1♀ from Road to Attuhullipura, Mysore, 25.ii.2000, Coll: G. Thirumalai; 1♂ and 1♀ from Kabini River and around, Mysore, 22.ii.2000, Coll: G. Thirumalai; 1♂ and 2♀♀ from Amera Hallikere,Kolar , 12.xii.2001, Coll: M. B. Raghunathan; 3♂♂, 3♀♀ and 1 immature from B. R. Hills, Mysore, 22.xi.1999, Coll: M. B. Raghunathan;

Distribution: INDIA: Andaman and Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chandigarh, Delhi, Goa, Gujarat, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Orissa, Pondicherry, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal. AUSTRALIA; CHINA; INDONESIA; JAPAN; MALAYASIA; MYANMAR; NEW GUINEA; NEW ZEALAND; SRI LANKA; THAILAND.

Subfamily LETHOCERINAE

Genus ***Lethocerus*** Mayr, 1853

Subgenus ***Lethocerus*** Mayr, 1853

61. ***Lethocerus (Lethocerus) indicus***
(Lepeletiler & Serville, 1825)

1825. *Belostoma indica* Lepeletiler & Serville, *Encycl. Meth.*, **X**: 272

1871. *Belostoma indicum* Lepeletiler & Serville, Mayr, *Verh.zool.-bot.Ges.Wien*, **21**: 426.

1901b. Amorgius *indicus* Kirkaldy, *Entomologist*, **34**: 51.

1906. *Belostoma indicum* (Lepeletiler & Serville): Distant, *Fauna British India*, **3**: 38.

1911. *Belostoma indica* Lepeletiler & Serville: D'Abreu, *J.Bombay nat. Hist.*, **20**: 883.

1927. *Lethocerus indicus* (Lep.& Serv.) : Torre-Bueno *Bull. Brooklyn Entomol. Soc.*, **22**: 30

2006. *Lethocerus indicus* (Lep. & Serv.): Thirumalai & Suresh Kumar, *Zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series*, **27**: 66.

2007. *Lethocerus (Lethocerus) indicus* (Lepeletiler & Serville): Thirumalai and Valarmathi, *Zool. Surv. India Fauna of Bannerghatta National Park, Conservation Area Series*, **33**: 56.

Diagnosis: The 'giant Indian water bug' large, elongate, dorsoventrally flattened brown aquatic bug; divergent yellow line on anterior lobe of pronotum broad; eyes twice as long as wide and elongate. Members of this genus are found in deeper water bodies such as pond, lakes, flooded paddy fields etc.

Material examined: 1♂ from Kalani road, 2.iv.1999, Coll. G. Thirumalai; 1♂ from Gubamadugu, 20-iii-2004, Coll: K. Rema Devi; 2♂♂ from Udigabande, 18-iii-2004, Coll: K. Rema Devi; 1♂ and 1♀ from Doddannakere, 17-iii-2004, Coll: K. Rema Devi; 1♂ from Nelgavi 21-iii-2004, Coll: K. Rema Devi.

Distribution: INDIA: Andaman and Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chandigarh, Delhi, Goa, Gujarat, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Orissa, Pondicherry, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal. CHINA; INDONESIA; MALAYSIA; MYANAMAR; PAKISTAN; SRI LANKA.

Family PLEIDAE

Genus ***Paraplea*** Esaki & China, 1928

62. ***Paraplea frontalis*** (Fieber, 1844)

1844. *Plea frontalis* Fieber, *Entomologische Mongraphien, Leipzig,* 18.

1947. *P. (Paraplea) frontalis* (Fieber): Hafiz & Pradhan. *Rec. Indian Mus.,* **45**: 349.

1999. *Praplea frontalis* (Fieber, 1844): Thirumalai. *IAAB,* **7**: 34.

1910. *Plea pelopea* Distant, *Fauna British India,* **5**: 336.

Material examined: Nil.

Distribution: INDIA: Andaman & Nicobar Islands, Andhra Pradesh, Arunachal Pradesh. Bihar, Chandigarh, Karnataka, Maharashtra, Orissa, Pondicherry, Punjab, Tamilnadu, Uttar Pradesh, Uttarakhand, West Bengal. MYANMAR, FORMOSA, JAVA, SUMATRA.

Family NAUCORIDAE LEACH

Subfamily LACCOCORINAE STÅL

Genus ***Heleocoris*** Stal, 1876

63. ***Heleocoris bergrothi*** Montandon, 1897

1897. *Heleocoris bergrothi* Montandon, *Verh. Z-b. Ges. Wien*, xlvii: 448.

1974. *Heleocoris bergrothi* Montandon: La Rivers, *Occ. Pap. Biol. Soc. Nevada*, 38.

2006. *Heleocoris bergrothi* Montandon: Thirumalai & Suresh Kumar, *Zool. Surv .India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 70.

Diagnosis: Oval, 10mm long; light yellow with black thick spots on the head and pronotum; scutellum black with its tip yellow, a yellow 'V' shaped discal spot differentiates this species from all known Indian species.

Material examined: 1♂, 1♀, 1 Is from Road to Sebinakare, 4.iv.1999, Coll. G. Thirumalai.

Distribution: INDIA: Karnataka, Kerala, Tamilnadu.

Family HELOTREPHIDAE

Subfamily HELOTREPHINAE

Tribe **Limnotrephini**

Genus ***Limnotrephes*** Esaki & China, 1928

64. ***Limnotrephes campbelli*** Esaki & China, 1928

1928. *Limnotrephes campbelli* Esaki & China, *Eos. Revta. Esp. Entomol.,* **4**: 161.

1990. *Limnotrephes campbelli* Esaki & China: Polhemus, *Acta. Entomol. Bohemoslov,* **87**: 61.

Material examined: Nil.

Distribution: INDIA: Karnataka.

Family CORIXIDAE

Subfamily CORIXINAE

Tribe **Agraptocorixini**

Genus ***Agraptocorixa*** Kirkaldy, 1898

65. ***Agraptocorixa hyalinipennis hyalinipennis*** (Fabricius, 1803)

1803. *Sigara hyalinipennis* Fabricius, *Syst. Rhyn Brusvigae,* 105.

1918. *Corixa unicolor* Paiva, *Rec. Indian Mus.,* **14**: 30.

1922. *Corixa paivana* Dover in Paiva & Dover, *Rec Indian Mus.,* **24**: 333.

1926. *Agraptocorixa hyalinipennis* (Fabricius): Jaczewski, *Ann. Zool. Mus. Polon. Warsaw*, **5**: 18

1940. *Agraptocorixa(Agraptocorixa) hyalinipennis* (Fabricius): Hutchinson, *Trans. Connecticut Acad. Art. Sci.,* **33**: 411.

2005. *Agraptocorixa hyalinipennis* (Fabricius): Thirumalai & Suresh Kumar, *Rec. zool. Surv. India*, **105**(1-2): 8.

2007. *Agraptocorixa hyalinipennis hyalinipennis* (Fabricius): Thirumalai and Valarmathi, *Zool. Surv. India Fauna of Bannerghatta National Park, Conservation Area Series,* **33**: 48.

Diagnosis: This species can be very easily recognized by its uniform hyaline brown coloration, unmarked elytra and pronotum. The abdominal

sixth dorsum bearing the strigil, produced backwards as a well-defined peduncle (Fig. 2 A). *A. hyalinipennis* is the only species of the genus so far known from India and commonly found to inhabit the ditches, puddles and stagnant pools in various parts of the country including Eastern and Western Ghats.

Material Examined: 13♂ and 29♀ from Nachenkere, 22-iii-2004, Coll: K. Rema Devi; 1♂ and 4♀ from Pillvarathahalli, Coll: G. Thirumalai; 52♂, 28♀ and 4 immature from Boothanapalli, 22-iii-2004, Coll: K. Remadevi; 1♂ and 1♀ from Chickrahalli, 16-iii-2003, Coll: S. Krishnan; 1♂ from Horahalli range, Bettahalli Kavalu, 23-iii-2004, Coll: K. Rema Devi; 1♀ from Thallibande, 24-iii-2004, Coll: K. Rema Devi.

Distribution: INDIA: Andhra Pradesh, Arunachal Pradesh, Assam, Chandigarh, Delhi, Gujarat, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Manipur, Orissa, Pondicherry, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal. MYANMAR; NEW GUINEA; PAKISTAN; TAIWAN.

Tribe **Corixini**

Genus ***Sigara*** Fabricius, 1775

Subgenus ***Tropocorixa*** Hutchinson

66. ***Sigara (Tropocorixa) graveleyi*** (Hutchinson, 1940) *

1940. *Corixa (Tropocorixa) graveleyi* Hutchinson, *Trans. Conn. Acad. Arts. Sci.* **33**: 453.

2001. *Corixa (Tropocorixa) graveleyi* Hutchinson: Thirumalai, ZSI, *Fauna of Conservation Area,* **11**: 113.

2006. *Sigara (Tropocorixa) graveleyi* (Hutchinson): Thirumalai & Suresh Kumar, *zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 70.

Diagnosis: Pronotum dark brown with ten pale yellow lines; the males are characterized by conspicuous brush like hairs on the right side of the 8th dorsal abdominal segment.

Material Examined: 15♂, 36♀, 25Is from Kalani road, 2.iv.1999, Coll. G. Thirumalai; 2♂, 6♀, 1Is from Basavanagodu, 3.iv.1999, Coll. G. Thirumalai; 8♂, 9♀ from Road to Sebinakare, 4.iv.1999, Coll. G. Thirumalai; 2♀ from Sebinakare to Duraisanialla, 27.ii.2000, Coll. G. Thirumalai and 3♂, 13♀, 1Is from Biligiri Rangaswamy Temple hills, 29.ii.2000, Coll. G. Thirumalai.

Distribution: INDIA: Goa, Madhya Pradesh, Maharashtra, Tamil Nadu.

Remarks : This species is being recorded for the first time from the State.

67. ***Sigara (Tropocorixa) horana*** (Hutchinson, 1940) *

1940. *Corixa (Tropocorixa) horana* Hutchinson, *Trans. Conn. Acad. Arts. Sci.,* **33**: 435.

2001. *Sigara (Tropocorixa) horana* Hutchinson: Thirumalai, ZSI, *Fauna of Conservation Area,* **11**: 113.

2001. *Sigara (Tropocorixa) horana* Hutchinson: Thirumalai & Suresh Kumar, *zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 70.

Diagnosis: Strigil (stridulatory comb) present on the right side of the 6th tergite of male, pala (the foreleg) sub-triangular with 24-26 pegs; female difficult to identify without the associated male.

Material Examined: 9♂, 13♀ from Kalani road, 2.iv.1999, Coll. G. Thirumalai and 1♂, 1♀ from Parashukatta, 28.ii.2000, Coll. G. Thirumalai.

Distribution: INDIA: Karnataka (present report), Tamilnadu.

Remarks: The type locality of this species is Nilgiris and the present record is the first report outside the type locality. Hence it is a new record from the State.

68. ***Sigara (Tropocorixa) promontoria*** Distant, 1910

1910. *Corixa promontoria* Distant, *Fauna British India,* **5**: 341.

1940. *Corixa (Tropocorixa) promontoria* Distant : Hutchinson, *Trans. Connecticut Acad. Art. Sci.,* **33**: 437.

Material Examined: Nil.

Distribution: INDIA: Bihar, Delhi, Karnataka, Orissa, Punjab, Rajasthan, Uttar Pradesh, West Bengal.

69. ***Sigara (Tropocorixa) pruthiana*** (Hutchinson, 1940)

1940. *Corixa (Trpocorixa) pruthiana* Hutchinson, *Trans. Connecticut Acad. Art. Sci.,* **33**: 447.

1989. *Corixa (Trpocorixa) pruthiana* Hutchinson : Thirumalai, *Misc. Occ. Pap. Rec. zool. Surv. India,* **118**: 13.

1999b. *Sigara (Tropocorixa) pruthiana* (Hutchinson): Thirumalai, *Zoos Print J.,* : **1-10**:132

2001. *Sigara (Trpocorixa) pruthiana* (Hutchinson): Thirumalai, *Fauna conservation area,* **11**: 114.

2004. *Sigara (Trpocorixa) pruthiana* (Hutchinson): Thirumalai, *Rec. zool. Surv. India,* **102**: 68.

2007. *Sigara pruthiana* (Hutchinson): Thirumalai and Valarmathi, *Zool. Sur. India, Fauna of Bannerghatta National Park, Conservation Area Series,* **33**: 49.

Diagnosis: General colour pale yellow or brown and palae are parallel sided with pegs uniformely, closely placed. The right paramere of male with broad base, a central blunt process on the dorsal margin, a well marked subapical tubercle on the ventral margin and a broad elongate beak at the apex.

Material examined: 1♂ and 1♀ from Chickrahalli, 16-iii-2003, Coll: S. Krishnan.

Distribution: INDIA: Karnataka, Tamilnadu, Uttar Pradesh.

Subfamily CYMATINAE

Genus ***Cymatia*** Flor, 1860

70. ***Cymatia apparens*** (Distant, 1910)

1910. *Corixa apparens* Distant, *Fauna British India,* **5**: 343.

1940. *Cymatia apparens* (Distant): Hutchinson, *Trans. Connecticut Acad. Art. Sci.,* **33**: 405.

1879. *Corixa hieroglyphia* Distant, *Rhynchota,* **2**: 13.

Material examined: Nil.

Distribution :INDIA: Andhra Pradesh, Bihar, Jammu & Kashmir, Karnataka, Maharashtra, Manipur, Uttar Pradesh, West Bengal.

Subfamily MICRONECTINAE

Genus ***Micronecta*** Kirkaldy, 1897

Subgenus *Basilonecta* Hutchinson , 1940

71. ***Micronecta scutellaris scutellaris*** (Stal, 1858)

1858. *Sigra scutellaris* Stål , *Vetens akad. Forh.,* **15**: 319.

1908. *Micronecta malabarica* Kirkaldy, *Canad. Ent.,* **40**: 209.

1910. *Micronecta dione* Distant , *Fauna Brit. India,* **5**: 348.

1910. *Micronecta malabarica* Kirkaldy: Distant , *Fauna Brit. India,* **5**: 347.

1910. *Micronecta proba* Distant , *Fauna Brit. India,* **5**: 348.

1940. *Micronecta. (Basilonecta) scutellaris scutellaris* (Stål): Hutchinson, *Trans. Connecticut Acad. Art. Sci.,* **33**: 365.

1940. *Micronecta scutellaris pseudostriata* Hutchinson, *Trans. Connecticut Acad. Art. Sci.,* **33**: 371.

2005. *Micronecta (Basilonecta) scutellaris scutellaris* (Stål): Thirumalai & Sharma, *Zool. Surv. India, Fauna of Melghat Tiger Reserve Conservation Area Series,* **24**: 352.

2006. *Micronecta (Basilonecta) scutellaris scutellaris* (Stål): Thirumalai & Suresh Kumar, *Zool. Surv. India. Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 72.

2007. *Micronecta scutellaris scutellaris* (Stål): Thirumalai and Valarmathi, *Zool. Surv. India, Fauna of Bannerghatta National Park, Conservation Area Series,* **33**: 49.

Diagnosis: This is a very widely distributed species in India and mostly found in stagnant pools, pond and ditches. It is the most common member and the largest species (2.8 to 3.1 mm) of the genus. It can be identified by club shaped tip of the left paramere and grey or greyish brown pronotum of males.

Material examined: 1♂, 4♀ from Parashukatta, 28.ii.2000, coll. G. Thirumalai; 60♂, 67♀ and 30 immature from Amba Temple Tank, 11-ix-2003, Coll: G. Thirumalai.

Distribution: INDIA: Andhra Pradesh, Assam, Bihar, Chandigarh, Delhi, Gujarat, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal. AFRICA (CENTRAL); CHINA; INDONESIA;

MALAYSIA; SAUDI ARABIA; SRI LANKA; VIETNAM.

72. ***Micronecta siva*** (Kirkaldy, 1897)

1897. *Sigara siva* Kirkaldy, *Entomologist London,* **30**: 240.

1940. *Micronecta (Basilonecta) siva* (Kirkaldy): Hutchinson, *Trans. Connecticut Acad. Art. Sci.*, **33**: 371.

1906. *Micronecta striata* Fieber: Distant, *Fauna British India,* **3**: 50.

Material examined: Nil

*Distribution :*INDIA: Andhra Pradesh, Assam, Karnataka, Orissa, Tamil Nadu, Uttar Pradesh, West Bengal.

Subgenus ***Dichaetonecta*** Hutchinson, 1940

73. ***Micronecta (Dichaetonecta) desertana dravida*** Hutchinson, 1940

1940. *M. (Dichaetonecta) desertana dravida* Hutchinson, *Trans. Conn. Acad. Art. Sci.,* **33**: 392.

2001. *M. (Dichaetonecta) desertana dravida* Hutchinson: Thirumalai, *ZSI. Fauna Conservation area,* **11**: 114.

2006. *M. (Dichaetonecta) desertana dravida* Hutchinson: Thirumalai & Suresh Kumar, *zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 72.

Diagnosis: Dark brownish yellow; size 2.7 to 2.9mm; the apex of the right paramere knob like, left paramere without any groove and denticulation.

Material examined: 5♂, 2♀, 2 Is from Dodithagadu, 5.iv. 1999, coll. G. Thirumalai.

Distribution: INDIA: Assam, Karnataka, Maharashtra, Punjab, Tamil Nadu. IRAN; SRI LANKA.

Remarks: This species occurs with different geographical races and with many subspecies.

74. ***Micronecta (Dichaetonecta) flavens*** Wroblewski, 1960 *

1960. *Micronecta flavens* Wróblewski, *Ann. zool. Polon. Warszaw,* **18**: 317.

1972. *Micronecta flavens* Wróblewski: Wróblewski, *Bull. Entomol. Pologne.*, **42**:17

1999. *Micronecta (Dichaetonecta) flavens* Wróblewski: Thirumalai, *Zoos Print J.* **1-10**:133.

2001. *Micronecta (Dichaetonecta) flavens* Wróblewski: Thirumalai, *Fauna conservation area,* **11**: 114.

2007. *Micronecta flavens* Wróblewski: Thirumalai and Valarmathi, *Zool. Sur. India, Fauna of Bannerghatta National Park, Conservation Area Series,* **33**: 50.

Diagnosis: M. flavens can be identified by narrow metaxiphus which is parabolic in outline. However, the parameters are very distinct with right has its shaft swollen in the middle and apex while the tip of left paramere dilated and the right margin with wrinkles and barbs. This species is very common in Sri Lanka.

Material examined: 15 ♂♂ and 17♀♀ from Ebella, Andergangvalail, 14.ix.2003, Coll: Thirumalai.

Distribution: INDIA: Tamilnadu, Karnataka (present record).

Remarks : This species is being reported for the first time from the State.

75. ***Micronecta (Dichaetonecta) prashadana*** Hutchinson, 1940

1940. *Micronecta (Dichaetonecta) prashadana* Hutchinson, *Trans. Connecticut Acad. Art. Sci.,* **33**: 387.

Material examined: Nil.

Distribution: INDIA: Karnataka, Madhya Pradesh, Tamil Nadu, Uttar Pradesh.

76. ***Micronecta (Dichaetonecta) sanctae-catherine*** Hutchinson, 1940

1940. *Micronecta (Dichaetonecta) sanctae-catherine* Hutchinson, *Trans. Connecticut Acad. Art. Sci.,* **33**: 384.

Material examined: Nil.

Distribution: INDIA: Goa, Karnataka, Maharashtra.

Subgenus ***Indonectella*** Hutchinson, 1940

77. ***Micronecta (Indonectella) grisea*** (Fieber, 1844)

1844. *Sigara grisea* Fieber, *Entomol, Mono. Leipzig*, 14.

1910. *M icronecta thyesta* Distant, *Fauna Brit. India*, **5**: 349.

1940. *M (Indonectella) thyesta* Distant: Hutchinson, *Trans. Conn. Acad. Art. Sci.,* **33**: 363.

1995. *M. (I) grisea* (Fieber): Jansson, *Catal. Heter. Palearctic region,* **1**: 30.

2001. *M. (I) thyesta* Distant: Thirumalai, *ZSI. Fauna of Conservation Area,* **11**: 115.

2006. *M. (I) grisea* (Fieber): Thirumalai & Suresh Kumar, *Zool.Surv.India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 71.

Diagnosis: It can be differentiated from the known oriental forms by the absence of strigil (stridulatory comb) in males and the distal margin of free lobe of eighth abdominal tergite, deeply emarginated. General colour greyish-yellow with head darkened posteriorly. Head evenly rounded anteriorly.

Material examined: 13♂, 11♀, 2 Is from Parashukatta, 28.ii.2000, coll. G. Thirumalai.

Distribution: INDIA: Andhra Pradesh, Assam, Bihar, Karnataka, Madhya Pradesh, Orissa, Tamilnadu, West Bengal. CHINA; VIETNAM.

Subgenus *Sigmonecta* Wroblewski,1962

78. ***Micronecta (Sigmonecta) quadristrigata*** Breddin, 1905

1905. *Micronecta quadristrigata* Breddin, *Soc. Ent. Zurich,* **20**: 57;

2001. *Micronecta quadristrigata* Breddin: Thirumalai, *ZSI, Fauna of Coservation Area,* **11**: 115

2006. *Micronecta (Sigmonecta) quadristrigata* Breddin: Thirumalai & Suresh Kumar, *zool. Surv. India, Fauna of Biligiri Rangaswamy Temple Wildlife Sanctuary, Conservation Area Series,* **27**: 71.

Diagnosis: The eighth abdominal tergite of the males is sigmoid in outline. The seventh abdominal tergite has four, moderately enlarged bristles.

Material examined: 2 ♂ from Parashukatta, 28.ii.2000, coll. G. Thirumalai.

Distribution: INDIA: Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chandigarh, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, West Bengal. INDONESIA; IRAN; MALAYSIA; PHILLIPINES; SRILANKA.

Remarks: It is very common in the Southern and Eastern parts of India. It is also reported to occur in brackish water pools. It has also been collected from the backwaters of Madras Coast (Salinity 4.2‰) by the senior author.

NOTE: Jansson (1995) regarded *M. minthe* as a separate species found in SriLanka. However, certain forms of *minthe* are *quadristrigata.*

SUMMARY

The present studies on the water-bug fauna from the state of Karnataka is a pioneer attempt for a consolidated taxonomic-cum- faunal account from the state as there was no such studies earlier. Total 78 species under 42 genera of 11 families of water bugs have been recorded in the fauna of Karnataka. Out of which 11 species have been recorded for the first time from Karnataka.

ACKNOWLEDGEMENTS

The author is thankful to Director, Dr. K. Venkataraman for facilities and encouragements. He is also thankful to Dr. S. Krishnan, Scientist- E and the colleagues of Southern Regional Centre, Chennai, for their kind co-operation.

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INSECTA : NEUROPTERA

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INTRODUCTION

Neuroptera is an important order of predacious insects which includes many small to large sized, soft bodied structurally and biologically heterogenous members. They are readily recognized by the network of veins of generally transparent wings and well developed antennae. The neuropterans are rarely abundant in numbers and most are weak in flight. They feed on soft-bodied insects including pests in their larval and adult stages thus considered as valuable allies of man. Their carnivorous habit offers a better scope for their use in biological control measures.

Numerically about 5500 species are known from the world and Indian fauna accounts for 354 species/subspecies (Oswald, 2007). The neuropterans of Karnataka State belong to 32 species of 24 genera under 8 families as enumerated below.

Order NEUROPTERA

Suborder PLANIPENNIA

Family CONIOPTERYGIDAE

Subfamily ALEUROPTERYGINAE

Tribe **Aleuropterygini**

1. Genus ***Heteroconis*** Enderlein, 1905

1. *Heteroconis terminalis* (Banks, 1913)
Distribution : Karnataka

Family MANTISPIDAE

Subfamily MANTISPINAE

2. Genus ***Mantispa*** Illiger, 1798

2. *Mantispa femoralis* Navás, 1914
Distribution : Karnataka

3. *Mantispa indica* Westwood, 1852
Distribution : Karnataka

4. *Mantispa maindroni* Navás, 1909
Distribution : Karnataka

Family HEMEROBIIDAE

Subfamily NOTIOBIELLINAE

3. Genus ***Psectra*** Hagen, 1866

5. *Psectra iniqua* (Hagen, 1859)
Distribution: Karnataka

Subfamily HEMEROBIINAE

4. Genus ***Hemerobius*** Linnaeus, 1758

6. *Hemerobius harmandinus* Navás 1910
Distribution : Karnataka

Subfamily MICROMINAE

5. Genus ***Micromus*** Rambur, 1842

7. *Micromus calidus* Hagen, 1859
Distribution : Karnataka

8. *Micromus timidus* Hagen, 1853
Distribution : Karnataka

Family BEROTHIDAE

Subfamily BEROTHINAE

6. Genus ***Berotha*** Walker, 1856

9. *Berotha insolita* Walker, 1860
Distribution : Karnataka

Family CHRYSOPIDAE

Subfamily CHRYSOPINAE

Tribe **Belonopterygini**

7. Genus ***Italochrysa*** Principi, 1946

10. *Italochrysa aequalis aequalis* (Walker, 1853)
Distribution : Karnataka

Tribe **Chrysopini**

8. Genus ***Brinckochrysa*** Tjeder, 1966

11. *Brinckochrysa scelestes* (Banks, 1911)
Distribution : Karnataka

9. Genus ***Chrysopa*** Leach, 1815

12. *Chrysopa cymbele* Banks, 1933
Distribution : Karnataka

13. *Chrysopa smitzi* Navás, 1914
Distribution : Karnataka

10. Genus ***Chrysoperla*** Steinmann, 1964

14. *Chrysoperla orestes* (Banks, 1911)
Distribution : Karnataka

11. Genus ***Mallada*** Navás, 1925

15. *Mallada madestes* (Banks, 1911)
Distribution : Karnataka

12. Genus ***Plesiochrysa*** Adams, 1982

16. *Plesiochrysa lacciperda* (Kimmins, 1955)
Distribution : Karnataka

Family MYRMELEONTIDAE

Subfamily PALPARINAE

Tribe **Palparini**

13. Genus ***Indopalpares*** Rambur, 1842

17. *Indopalpares pardus* (Rambur, 1842)
Distribution : Karnataka

14. Genus ***Palpares*** Rambur, 1842

18. *Palpares contrarius* (Walker, 1853)
Distribution : Karnataka

15. Genus ***Stenares*** Hagen, 1866

19. *Stenares frazeri* Banks, 1931
Distribution : Karnataka

20. *Stenares improbus* (Walker, 1853)
Distribution : Karnataka

Subfamily MYRMELEONTINAE

Tribe **Acanthaclisini**

16. Genus ***Syngenes*** Kolbe, 1897

21. *Syngenes horridus* (Walker, 1853)
Distribution : Karnataka

Tribe **Nemoleontini**

Subtribe **Neuroleontina**

17. Genus ***Creoleon*** Tillyard, 1918

22. *Creoleon irene* (Banks, 1939)
Distribution : Karnataka

18. Genus ***Neuroleon*** Navás, 1909

Subgenus ***Neuroleon***, 1909

23. *Neuroleon (Neuroleon) pallidus* (Banks, 1939)
Distribution : Karnataka

Family ASCALAPHIDAE

Subfamily ASCALAPHINAE

Tribe **Ascalaphini**

19. Genus ***Ascalaphus*** Fabricius, 1775

24. *Ascalaphus abdominalis* (Kimmins, 1949)
Distribution : Karnataka

25. *Ascalaphus dicax* Walker, 1853
Distribution : Karnataka

Tribe **Suhpalacsini**

20. Genus ***Suphalomitus*** Weele, 1908

26. *Suphalomitus brevis* Kimmins, 1949
Distribution : Karnataka

Tribe **Hybrisini**

21. Genus ***Glyptobasis*** MacLachlan, 1873

27. *Glyptobasis dentifera* (Westwood, 1847)
Distribution : Karnataka

28. *Glyptobasis nugax* (Walker, 1853)
Distribution : Karnataka

Tribe **Encyoposini**

22. Genus ***Bubopsis*** MacLachlan, 1898

29. *Bubopsis rubrapunctata* Ghosh, 1981

Distribution : Karnataka

23. Genus ***Ogcogaster*** Westwood, 1848

30. *Ogcogaster kempi* Fraser, 1922

Distribution : Karnataka

31. *Ogcogaster segmentator* (Westwood, 1847)

Distribution: Karnataka

Family NEMOPTERIDAE

Subfamily CROCINAE

24. Genus ***Croce*** MacLachlan, 1898

32. *Croce filipennis* (Westwood, 1841)

Distribution : Karnataka

SUMMARY

The enumeration of neuropteran fauna of Karnataka State resulted in 32 species of 24 genera under 8 families.

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Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 167-172, 2013

INSECTA: COLEOPTERA : TENEBRIONIDAE

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INTRODUCTION

Occurrence of many species of the order Coleoptera are with special ecological requirements for their continued existence and can be used as indicators of ecological conditions. Beetles provided suitable material for all types of studies on comparative biology. They also offer a classic example of evolutionary diversification.

The family Tenebrionidae is the fifth largest family under the order Coleoptera and representatives of the family are found in almost all the habitats. The representatives of this family are hard to differentiate but can be identified by these characters. Body hard, antennal insertion hidden under frons, elytra usually completely covering abdomen, abdomen with five visible sternites and first three segments connate, front coxal cavities closed behind, heteromerous tarsi, tarsal segments and claws simple. Since there is no comprehensive study on the Tenebrionidae fauna of Karnataka state, an attempt has been made to throw some light by preparing the check-list of Tenebrionidae of Karnataka state.

To make the study comprehensive, all earlier scattered reports were taken into consideration and few important references were noted. (Iwan, 2002, Iwan and Ferrer, 1998, Iwan *et al.* 2010, Kaszab, 1961,1975, Masumoto 1995, Sabu *et al.* 2007, Schawaller and Ando, 2009). The paper contains the report of 47 species of 23 genera under 12 tribes of 04 subfamilies from Karnataka state. The classification was followed as per Bouchard *et al.* (2005). Few species are not having synonyms.

SYSTEMATIC CHECK-LIST

Subfamily LAGRIINAE Latreille, 1825 (1820)

Tribe **Lupronini** Ardoin, 1958

1. ***Luprops gracilior*** Fairmaire, 1896

Lyprops gracilior Fairmaire, 1896:28

Distribution: India: Karnataka (Bangalore), Kerala, Madhya Pradesh, West Bengal, Assam, Maharashtra.

Elsewhere: Bhutan and Pakistan.

2. ***Luprops tristis*** (Fabricius, 1801)

Lagria tristis Fabricius 1801: 70.

Lyprops piceus Fairmaire 1894: 24

Distribution: India: Karnataka (Bangalore), Tamil Nadu, Kerala, Andhra Pradesh and Sikkim.

Elsewhere: Sri Lanka.

Tribe: **Cossyphini** Latreille, 1802

3. ***Cossyphus (Cossyphus) depressus*** (Fabricius, 1781)

2000., *Cossyphus cossyphus depressus* (Fabricius, 1781) *Scupola* : 231.

2000., *Cossyphus cossyphus planus* Fabricius, 1801. *Scupola* : 231.

Distribution: INDIA: Karnataka (Shimoga), Tamil Nadu, West Bengal and Uttar Pradesh (Hardoi and Sitapur districts) (Hegde, 2012).

Elsewhere: Not yet recorded.

Subfamily **Tenebrioninae** Latreille,1802

Tribe **Toxicini** Lacordaire, 1859

4. ***Cryphaeus tenuis*** (Fairmaire 1896)

Distribution: India: Karnataka (Kanara).

Elsewhere: Nepal.

Tribe **Alphitobini** Reitter, 1917

5. ***Alphitobius laevigatus*** (Fabricius, 1781)

1781, *Alphitobius laevigatus* Fabricius, *Spec. Ins.* **1:** 90.

Alphitobius laevigatus (Fabricius), Kaszab, *Tijdschr. V. Ent. C.* **VII** (5): 295.

Distribution: India: Karnataka, West Bengal, Assam, Uttar Pradesh, Rajasthan and Andaman Island.

Elsewhere: Cosmopolitan in distribution.

6. ***Alphitobius piceus*** Olivier, 1972

1972, *Alphitobius piceus* Olivier, *Encycl. Meth* **7**: 50.

Distribution: India: Karnataka, West Bengal (Calcutta, Bankura) Cosmopolitan.

Elsewhere: Cosmopolitan in distribution.

Tribe **Tribolini** Mulsant, 1854

7. ***Tribolium castaneum*** (Herbst, 1797)

1797., *Tribolium castaneum* (Herbst) Nature kafer, 7: 2

1825., *Tribolium castaneum* Macleay, *Annulora javanica* : 50

Distribution: India: Karnataka, West Bengal (Calcutta, Howrah, North 24 paragnas). Cosmopolitan.

Elsewhere: Cosmopolitan in distribution.

8. ***Tribolium confusum*** Jacquelin du Val, 1868

1868., *Tribolium confusum* Jacquelin du Val, *Gen. col d. Eur. Cat.*, P 181.

Distribution: India: Karnataka, West Bengal, Cosmopolitan.

Elsewhere: Cosmopolitan in distribution.

Tribe **Ulomini** Blanchard, 1845

9. ***Hypophloeus ratzeburgii*** Wissman, 1848

1848, *Hypophloeus ratzeburgii* Wissmam, *Stettein ent. Ztg.*, **9** : 77

*Distribution:*India: Karnataka, West Bengal (Calcutta) Cosmopolitan.

Elsewhere: Cosmopolitan in distribution.

10. ***Latheticus oryzae*** Waterhouse, 1880

1880, *Latheticus oryzae* Waterhouse, *Ann. Mag. Nat. Hist.*, **5**(V) : 148

1972, Kaszab, *Alti. Soc. It. Sc. Nat.c. Museo. Civ. St. Nat. Milono.*, **113** (4): 366-384.

*Distribution:*India: Karnataka, West Bengal (Calcutta) Cosmopolitan.

Elsewhere: Cosmopolitan in distribution.

Tribe **Pedinini** Eschscholtz, 1829

11. ***Adamus bellaryensis*** (Kaszab, 1975)

1975b., *Platydendarus bellaryensis* Kaszab, : 315.

Adamus bellaryensis: Iwan 1997a: 257, 2002: 50.

Distribution: India : Karnataka (Bellary).

Elsewhere: Not yet recorded.

12. ***Adamus mediocris*** (Fairmaire, 1896)

Platynotus mediocris Fairmaire, 1896: 14. - Gebien 1910b: 273, 1938b: 293.

Platydendarus mediocris: Kaszab 1975b: 314.

Adamus mediocris: Iwan 1997a: 257, 2002: 50.

Distribution: India: Karnataka (Belgaum).

Elsewhere: Not yet recorded.

13. ***Adamus opatroides*** (Kaszab, 1975)

Platydendarus opatroides Kaszab, 1975b: 316.

Adamus opatroides: Iwan 1997a: 257, 2002: 50.

Distribution: India: Karnataka (Bangalore).

Elsewhere: Not yet recorded.

14. ***Amblysphagus pachyderus*** Fairmaire, 1896

*Distribution:*India: Karnataka (Belgaum), Tamil Nadu (Madura, Trichinopoly).

Elsewhere: Not yet recorded.

15. ***Eucolus indicus*** Kaszab, 1975

Eucolus indicus Kaszab, 1975: 286. - Iwan 1997a: 259, 2002: 68.

Distribution: India: Karnataka (Bellary).

Elsewhere: Not yet recorded.

16. ***Menearchus longipennis*** Kaszab, 1975

Menearchus longipennis Kaszab, 1975b: 350. - Iwan 1997a: 260, 2002: 78.

Distribution: India: Karnataka (Samanahally, Bangalore).

Elsewhere: Not yet recorded.

17. ***Penthicoides seriatoporus*** Fairmaire, 1896

Penthicoides seriatoporus Fairmaire, 1896: 20. - Gebien 1910b: 287; 1938b: 309; Kaszab 1975b:357; Iwan 1997a: 264, 2002: 82.

Distribution: India: Karnataka (Belgaum).

Elsewhere: Not yet recorded.

18. ***Platyburak frilingeni*** (Kaszab, 1975)

Notocorax frilingeni Kaszab, 1975b: 305.

*Platyburak frilingen*i: Iwan 1990a: 126, 1997a: 266, 2002: 86.

Distribution: India: Karnataka (Bellary).

Elsewhere: Not yet recorded.

19. ***Platyburak girardi*** (Kaszab, 1975)

Notocorax girardi Kaszab, 1975b: 304.

*Platyburak girard*i: Iwan 1990a: 127, 1997a: 266, 2002: 86.

Distribution: India: Karnataka (Bellary).

Elsewhere: Not yet recorded.

20. ***Platyburak ramosus*** (Fairmaire, 1896)

Pseudoblaps ramosus Fairmaire, 1896: 15. - Gebien 1910b: 274, 1938b: 293.

Notocorax ramosus: Kaszab 1975b: 309.

Platyburak ramosus: Iwan 1990a: 127, 1997a: 266, 2002: 86.

Distribution : India: Karnataka (Belgaum).

Elsewhere: Not yet recorded.

21. ***Platycolpotus pandaroides*** (Fairmaire, 1893)

Platynotus pandaroides Fairmaire, 1896: 13. - Gebien 1910b: 273, 1938b: 293.

Platydentarus pandaroides: Kaszab 1975b: 314.

Platycolpotus pandaroides: Iwan 1997a: 267, 2002: 88.

Distribution: India: Karnataka (Belgaum).

Elsewhere: Not yet recorded.

22. ***Pseudonotocorax cornelli*** Iwan and Ferrer, 1998

Pseudonotocorax cornelli Iwan et Ferrer, 1998: 337 - Iwan 2002: 94.

Distribution: India : Karnataka (Bangalore), Maharashtra(Aurangabad).

Elsewhere: Not yet recorded.

Tribe **Opatrini** Brulle, 1832

23. ***Gonocephalum acuticolle*** Kaszab, 1952

Gonocephalum acuticolle Kaszab, 1952a: 616.

Distribution: India: Karnataka (Mysorer, Shimoga), Maharashtra (Poona).

Elsewhere: Not yet recorded.

24. ***Gonocephalum borosi*** Kaszab, 1952

Gonocephalum Borosi Kaszab, 1952a: 543.

Distribution: India: Karnataka (Mysore, Shimoga).

Elsewhere: Not yet recorded.

25. ***Gonocephalum brittoni*** Kaszab, 1952

Gonocephalum Brittoni Kaszab, 1952a: 618.

Distribution: India:Karnataka (Belgaum, Shimoga).

Elsewhere: Not yet recorded.

26. ***Gonocephalum catenulatum*** (Fairmaire, 1896)

Hopatrum catenulatum Fairmaire, 1896: 19.

Gonocephalum catenulatum (Fairmaire, 1896). - Gebien 1910b: 322,1939: 447; Kaszab 1952a: 463; Iwan and Löbl 2008: 263.

Distribution: India: Karnataka (Kanara), Himalaya, Bombay, Sikkim, Darjeeling District.

Elsewhere: Not yet recorded.

27. ***Gonocephalum civicum*** Kaszab, 1952

Gonocephalum civicum Kaszab, 1952a: 612. - Kaszab 1970a: 423,1977: 257; Schawaller 1997a: 4; Iwan and Löbl 2008: 263.

Distribution: India:Karnataka (Belgaum,

Mysore), Ranchi, Ahmed Nagar, Calcutta, Sikkim (Darjeeling District), Uttaranchal(Haridwar, Rurki).

Elsewhere: Nepal, Burma, Nepal and Thailand.

28. ***Gonocephalum dravidum*** Bremer and Ferrer, 1992

Gonocephalum dravidum Bremer et Ferrer, 1992: 85.

Distribution: India: (Mysore, Shimoga, Agumbe Ghat, 2000 ft).

Elsewhere: Not yet recorded.

29. ***Gonocephalum horni*** Kaszab, 1952

Gonocephalum Horni Kaszab, 1952a: 567. - Kaszab 1961a:4, 1979a:260, 1979b: 63.

Distribution: India: Karnataka (Mysore, Shimoga).

Elsewhere: Sri Lanka.

30. ***Gonocephalum laosense*** Kaszab, 1952

Gonocephalum laosense Kaszab, 1952a: 564. - Kaszab 1980b: 171.

Distribution : India: Karnataka (Mysore, Shimoga).

Elsewhere: Laos and Vietnam.

31. ***Gonocephalum marani*** Kaszab, 1952

Gonocephalum Maaani Kaszab, 1952a: 575.

Distribution : India:Karnataka (Mysore, Shimoga).

Elsewhere: Not yet recorded.

32. ***Gonocephalum mysorense*** Kaszab, 1952

Gonocephalum mysorense Kaszab, 1952a: 496. - Kaszab 1965a:113.

Distribution : India: Karnataka (Mysore, Shimoga).

Elsewhere: Not yet recorded.

33. ***Gonocephalum obenbergeri*** Kaszab, 1952

Gonocephalum Obenbergeri Kaszab, 1952a: 598. - Kaszab 1961a: 4,1979b: 64.

Distribution: India: Karnataka (Mysore, Shimoga, Kanara), Orissa Coast (Puri).

Elsewhere: Sri Lanka.

34. ***Gonocephalum semipatruele*** Kaszab, 1952

Gonocephalum semipatruele Kaszab, 1952a: 608. - Gridelli 1953: 63;Kaszab 1982b: 167; Iwan and Löbl 2008: 265.

Distribution: India: Karnataka (Belgaum), Uttarakhand, Punjab, Uttar Pradesh (Allahabad, Faizabad).

Elsewhere: Iran, Pakistan and Yemen.

35. ***Gonocephalum shimoganum*** Kaszab, 1952

Gonocephalum shimoganum Kaszab, 1952a: 597. - Kaszab 1979a:260, 1979b: 64.

Distribution: India: Karnataka (Mysore, Shimoga), Tamil Nadu (Trichinopoly, Nilgiri Hills).

Elsewhere: Sri Lanka.

36. ***Gonocephalum stoeckleini*** Kaszab, 1952

Gonocephalum Stöckleini Kaszab, 1952a: 662. - Kaszab 1961b: 351,1979b: 66.

Gonocephalum stöckleini Kaszab,1952. - Kaszab 1965a: 114.

Gonocephalum stoeckleini Kaszab,1952. - Iwan and Löbl 2008: 266.

Distribution : India: Karnataka(Mysore, Shimoga, Bangalore). Kashmir, Uttarakhand, Tamil Nadu (Trichinopoly, Madras, Coimbatore Nedungadu, Tajore Distr. Madura Arana Kurichi, Nilgiri Hills), Pondicherry, Orissa (Puri, Chilka Lake, Behrampur, Chota Nagpur), West Bengal (Calcutta).

Elsewhere: Sri Lanka and Pakistan.

37. ***Gonocephalum tenuicorne*** Kaszab, 1952

Gonocephalum tenuicorne Kaszab, 1952a: 590. - Kaszab 1979a: 260,1979b: 63, 1980b: 171; Iwan and Löbl 2008: 266.

Distribution : India: Karnataka (Mysore, Shimoga), Tamil Nadu (Shembaganur, Madura, Trichinopoly, Nilgiri Hills), West Bengal (Kurseong , Darjeeling), Sikkim.

Elsewhere: Myanmar, Tharrawaddy, Sri Lanka and Vietnam.

38. ***Mesomorphus gridellii*** Kaszab, 1963

Distribution: India: Karnataka (Shimoga), Karikal.

Elsewhere: Sri Lanka.

39. ***Mesomorphus villiger*** Blanch, 1853

Mesomorphus villiger Blanch, 1853, *Voy.Pole Sud.* **4**: 154, t.10, f.15.

Distribution: India: Karnataka (Dharwar, N.Kanara), West Bengal (Calcutta, Hoogly, Singur).

Elsewhere: Myanmar (Rangoon).

Sub Family DIAPERINAE Latreille, 1802

Tribe **Diaperini** Latreille, 1802

40. ***Ceropria bifasciata*** Chervolat, 1878 M-1

Ceropria bifasciata Chevrolat, 1878 *C.R. Soc. ent. Belg.*, 1878: CL (Bombay).

Distribution: India: Karnataka (Kanara), Maharashtra (Mumbai), Tamil Nadu (Shembaganur).

Elsewhere: Not yet recorded.

41. ***Ceropria purpurina*** Gebien 1925

Ceropria induta var. *purpurina* Gebien, 1925. *Philip. J. Sci.*, **27**: 277.

Distribution: India : Karnataka (Kanara), Uttarakhand (Ramnagar), Assam, Tamil Nadu, Himachal Pradesh.

Elsewhere: Nepal and Sri Lanka.

42. ***Spiloscapha sericans*** (Fairmaire, 1896)

Distribution: India: Karnataka (Belgaum).

Elsewhere: Not yet recorded.

Tribe **Leiochrini** Lewis, 1894

43. ***Derispia blairi*** Kaszab. ***nigromarginalis*** Kaszab,1961

Distribution: India: Karnataka (Coorg, Frasserpet.)

Elsewhere: Not yet recorded.

44. ***Derispia blairi*** Kaszab. ***maculata*** Kaszab,1961

Distribution: India: Karnataka (Coorg, Frasserpet.)

Elsewhere: Not yet recorded.

Tribe **Crypticini** Brulle, 1832

45. ***Sivacrypticus sericans*** (Fairmaire, 1896)

Distribution: India: Karnataka (Belgaum).

Elsewhere: Not yet recorded.

Subfamily STENOCHIINAE Kirby, 1837

Tribe **Cnodalonini** Gistel, 1855

46. ***Catapiestus indicus*** Fairmaire, 1896

Catapiestus indicus Fairmaire, 1896 : 28

Distribution: India: Karnataka(Kanara), Sikkim.

Elsewhere: Nepal.

47. ***Foochounus wasmanni*** (Blair, 1929)

Chariophenus wasmanni Blair, 1929: 240

Foochounus assamicus (Kaszab, 1965); Kaszab, 1983: 134 syn. nov.

Anobriomaia assamica Kaszab, 1965a: 127

Distribution: India: Karnataka (Frasserpet), Tamil Nadu (Nilgiri Hills), Assam (Ratu).

Elsewhere: Nepal.

ACKNOWLEDGEMENTS

I am thankful to Dr. K. Venkataraman, Director, Zoological Survey of India, Kolkata for the facilities and late Dr. G.Thirumalai, Addl. Director who has inspired me to do this work. I am indebted to Dr. Kailash Chandra, Addl. Director and Head, Entomology Division 'A' for his valuable suggestions in preparing the manuscript.

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Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 173-178, 2013

INSECTA : COLEOPTERA : SCARABAEIDAE : SCARABAEINAE DUNG BEETLES

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INTRODUCTION

Dung beetles are a group of ecologically important insects which use decomposing materials such as vertebrate dung, carrion and other rotting materials as food resource for the adults and the larvae. They have evolved several ways to overcome competition by quickly removing the dung or other resources and hiding them from the other potential competitors like the flies and other beetles. Traditionally, the dung beetles have been divided into three groups according to their mode of resource relocation into the rollers (teleocoprids), the tunnelers (paracoprids) and the dwellers (endocoprids) (Halffter and Matthews, 1966, Hanski and Cambefort, 1991). At present, the above classification is purely functional with limited phylogenitic significance due to polyphyletic origin of similar behavioural patterns (Phillips *et al.*, 2004).

The "true dung beetles" belong to the subfamily Scarabaeinae (Scarabaeidae, Coleoptera) which feed exclusively on faeces and carcasses, comprises of more than 5,000 species worldwide. The earlier contribution to the taxonomic works on Indian Scarabaeinae were mainly by Arrow (1931) and Balthasar (1963 a, b & 1964). The global database on the dung beetles (ScarabNet, 2010), has listed 322 species of scarabs belonging to 34 genera from India. Apart from the list of dung beetles reported from the Bilgiri Rangaswamy Temple Sanctuary (BRT) of Karnataka (Priyadarsanan, 2006) in which 7 tribes, 13 genera and 87 species were recorded, a comprehensive list of the dung beetles of Karnataka is lacking. The following list comprises 145 species of dung beetles belonging to 9 tribes and 23 genera reported so far from Karnataka. The places of collection from Karnataka are mentioned after the name string in brackets.

SYSTEMATIC ACCOUNT

Order COLEOPTERA

Superfamily SCARABAEOIDEA

Family SCARABAEIDAE

Subfamily SCARABAEINAE

Tribe **Scarabaeini**

Genus 1. ***Scarabaeus*** Linnaeus, 1758

1. *Scarabaeus* (s.str.) *gangeticus* (Castelnau, 1840) (Bangalore)
2. *Scarabaeus* (*Kheper*) *erichsoni* (Harold, 1867) (Bangalore, BRT, Rajiv Gandhi National Park, Nagarahole (RGNP))
3. *Scarabaeus* (*Kheper*) *sanctus* (Fabricius, 1798) (Bangalore, Belgaum)

Tribe **Gymnopleurini**

Genus 2. ***Gymnopleurus*** Illiger, 1803

4. *Gymnopleurus* (s.str.) *bombayensis* Arrow, 1931 (Belgaum)

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5. *Gymnopleurus* (s.str.) *cyaneus* (Fabricius, 1798) (Bellary, Bangalore, Belgaum, BRT)
6. *Gymnopleurus* (*Metagymnopleurus*) *gemmatus* Harold, 1871 (Bangalore, Belgaum)
7. *Gymnopleurus* (*Metagymnopleurus*) *miliaris* (Fabricius, 1775) (Mysore, Bangalore, BRT)
8. *Gymnopleurus* (*Metagymnopleurus*) *parvus* (Mac Leay, 1821) (BRT, Belgaum

Genus 3. ***Paragymnopleurus*** Shipp, 1897

9. *Paragymnopleurus melanarius* Harold, 1867 (North Kanara)
10. *Paragymnopleurus sinuatus* (Olivier, 1789) (Kanara)

Genus 4. ***Garetta*** Janssens, 1940

11. *Garreta dejeani* Castelnau, 1840 (BRT)
12. *Garreta sumptuosus* Castelnau, 1840 (BRT)

Genus 5. ***Allogymnopleurus*** Janssens, 1940

13. *Allogymnopleurus maculosus* (MacLeay, 1821) (Belgaum)
14. *Allogymnopleurus spilotus* (MacLeay, 1821) (Bangalore, BRT)

Tribe **Sisyphini**

Genus 6. ***Sisyphus*** Latreille, 1807

15. *Sisyphus* (s.str.) *crispatus hirtus* Wiedemann, 1823 (South Mysore, Bangalore, BRT)
16. *Sisyphus* (s. str.) *longipes* (Olivier, 1789) (Belgaum, BRT, RGNP)
17. *Sisyphus* (s.str.) *neglectus* Gory, 1833 (North Kanara, South Mysore, BRT, RGNP)

Tribe **Canthonini**

Genus 7. ***Ochicanthon*** Vaz-de-mello, 2003

18. *Ochicanthon laetus* Arrow, 1931 (BRT)

Tribe **Dichotomini**

Genus 8. ***Delopleurus*** Erichson, 1847

19. *Delopleurus purvus* (Sharp,1875)(Jakkar, Bangalore)

Tribe **Coprini**

Genus 9. ***Heliocopris*** Hope, 1837

20. *Heliocopris bucephalus* (Fabricius, 1775) (Karnataka, BRT)
21. *Heliocopris dominus* Bates, 1868 (Karnataka, BRT)

Genus 10. ***Catharsius*** Hope, 1837

22. *Catharsius capucinus* (Fabricius, 1781) (BRT)
23. *Catharsius granulatus* (Sharp, 1875) (BRT)
24. *Catharsius molossus* (Linnaeus, 1758) (Mysore, Bangalore, BRT, RGNP)
25. *Catharsius pithecius* (Fabricius, 1775) (BRT)
26. *Catharsius sagax* (Quenstedt, 1806) (BRT, RGNP)

Genus 11. ***Copris*** Geoffroy, 1762

27. *Copris* (*Paracopris*) *andrewesi* Waterhouse, 1891 (Belgaum, Mysore, North Kanara, Bangalore, BRT, RGNP)
28. *Copris* (s.str.) *carinicus* Gillet, 1910 (RGNP)
29. *Copris* (*Paracopris*) *davisoni* Waterhouse, 1891 (BRT, RGNP)
30. *Copris* (s.str.) *fricator* (Fabricius, 1787) (Mysore, Bangalore, BRT, RGNP)
31. *Copris* (*Paracopris*) *imitans* Felsche, 1910 (North Kanara, Belgaum, RGNP)
32. *Copris* (s.str.) *repertus* Walker, 1858 (Belgaum, Bangalore, BRT, RGNP)
33. *Copris* (s.str.) *sarpedon* Harold, 1868 (RGNP)
34. *Copris* (*Paracopris*) *signatus* Walker, 1858 (Bangalore, BRT)
35. *Copris* (s.str.) *sodalis* Walker, 1858 (BRT, RGNP)

Tribe **Onitini**

Genus 12. ***Cheironitis*** Lansberge, 1875

36. *Cheironitis arrowi* Janssens, 1937 (Belgaum)

Genus 12. ***Onitis*** Fabricius, 1798

37. *Onitis brahma* Lansberge, 1875 (Dharwar, Mysore, Bangalore)
38. *Onitis falcatus* (Wulfen, 1786) (Belgaum, BRT)
39. *Onitis philemon* Fabricius, 1801 (Belgaum, Mysore, Bangalore, BRT)

40. *Onitis singhalensis* Lansberge, 1875 (Coorg, South India, BRT, RGNP)
41. *Onitis siva* Gillet, 1911 (BRT, RGNP)
42. *Onitis virens* Lansberge, 1875 (Belgaum, North Coorg, BRT, RGNP)

Tribe **Oniticellini**

Genus 14. ***Drepanocerus*** Kirby, 1828

43. *Drepanocerus setosus* (Wiedemann, 1823) (BRT, RGNP)

Genus 15. ***Oniticellus*** Serveille, 1825

44. *Oniticellus cinctus* (Fabricius, 1775) (Mysore, BRT, RGNP)

Genus 16. ***Liatongus*** Reitter, 1892

45. *Liatongus* (s.str.) *affinis* (Arrow, 1908) (RGNP)
46. *Liatongus* (*Paraliatongus*) *rhadamistus* (Fabricius, 1775) (RGNP)

Genus 17. ***Tiniocellus*** Peringuey, 1901

47. *Tiniocellus spinipes* Roth, 1851 (BRT, Belgaum, RGNP)

Tribe **Onthophagini**

Genus 18. ***Caccobius*** Thomson, 1859

48. *Caccobius* (s.str.) *rufipennis* (Motschulski, 1858) (BRT, RGNP)
49. *Caccobius* (*Caccophilus*) *aterrimus* (Fabricius, 1798) (BRT)
50. *Caccobius* (*Caccophilus*) *diminutivus* (Walker, 1858) (BRT, RGNP)
51. *Caccobius* (*Caccophilus*) *gallinus* Arrow, 1907 (RGNP)
52. *Caccobius* (*Caccophilus*) *indicus* Harold, 1867 (Bangalore, BRT)
53. *Caccobius* (*Caccophilus*) *meridionalis* Boucomont, 1914 (Dharwar, Bangalore, BRT, RGNP)
54. *Caccobius* (*Caccophilus*) *torticornis* Arrow, 1931 (RGNP)
55. *Caccobius* (*Caccophilus*) *ultor* Sharp, 1875 (BRT, RGNP)
56. *Caccobius* (*Caccophilus*) *unicornis* Fabricius, 1798 (BRT, RGNP)
57. *Caccobius* (*Caccophilus*) *vulcanus* (Fabricius, 1801) (Bangalore, BRT, RGNP)

Genus 19. ***Cleptocaccobius*** Cambefort, 1984

58. *Cleptocaccobius inermis* Arrow, 1931 (BRT, RGNP)

Genus 20. ***Onthophagus*** Latreille, 1802

59. *Onthophagus* (s.str.) *abreui* Arrow, 1931 (BRT)
60. *Onthophagus* (*Colobonthophagus*) *agnus* Gillet, 1925 (Kanara)
61. *Onthophagus* (*Furconthophagus*) *amicus* Gillet, 1925 (RGNP)
62. *Onthophagus* (s.str.) *amphioxus* Arrow, 1931 (Chikballapur, Karnataka)
63. *Onthophagus* (s.str.) *amphicoma* Boucomont, 1914 (BRT)
64. *Onthophagus* (s.str.) *amphinasus* Arrow, 1931 (North Kanara)
65. *Onthophagus* (s.str.) *andrewesi* Arrow, 1931 (Kanara, RGNP)
66. *Onthophagus* (s.str.) *arboreus* Arrow, 1931 (Mysore)
67. *Onthophagus* (*Colobonthophagus*) *bengalensis* Harold, 1886 (BRT, RGNP)
68. *Onthophagus* (*Paraphanaeomorphus*) *bifasciatus* (Fabricius, 1781) (BRT, RGNP)
69. *Onthophagus* (s.str.) *brevicollis* Arrow, 1907 (Bangalore, BRT, RGNP)
70. *Onthophagus* (s.str.) *bronzeus* Arrow, 1907 (North Kanara, BRT)
71. *Onthophagus* (*Micronthophagus*) *cavia* Boucomont, 1914 (Nandidurg)
72. *Onthophagus* (s.str.) *cervus* (Fabricius, 1798) (BRT)
73. *Onthophagus* (s.str.) *centricornis* (Fabricius, 1798) (Belgaum, Kanara, BRT, RGNP)
74. *Onthophagus* (s.str.) *chrysurus* Arrow, 1931 (BRT, RGNP)
75. *Onthophagus* (s.str.) *circulifer* Arrow, 1931 (BRT)
76. *Onthophagus* (s.str.) *coeruleicollis* Arrow, 1907 (Belgaum, Dharwar)

77. *Onthophagus* (*Paraphanaeomorphus*) *comottoi* Lansberge, 1885 (BRT, RGNP)
78. *Onthophagus* (*Colobonthophagus*) *dama* (Fabricius, 1798) (Bangalore, Belgaum, Kanara, BRT, RGNP)
79. *Onthophagus* (*Gibbonthophagus*) *dubernardi* Boucomont, 1914 (RGNP)
80. *Onthophagus* (*Gibbonthophagus*) *duporti* Boucomont, 1914 (Belgaum, Kanara)
81. *Onthophagus* (s.str.) *ensifer* Boucomont, 1914 (BRT, RGNP)
82. *Onthophagus* (*Colobonthophagus*) *ephippioderus* Arrow, 1907 (Bangalore, Chikmagalur, Kanara, Belgaum)
83. *Onthophagus* (s.str.) *falcifer* Harold, 1880 (RGNP)
84. *Onthophagus* (s.str.) *falsus* Gillet, 1925 (BRT)
85. *Onthophagus* (s.str.) *fasciatus* Boucomont, 1914 (Belgaum, BRT, RGNP)
86. *Onthophagus* (s.str.) *favrei* Boucomont, 1914 (Belgaum, Bangalore, BRT, RGNP)
87. *Onthophagus* (*Paraphanaeomorphus*) *frugivorus* Arrow, 1931 (BRT)
88. *Onthophagus* (s.str.) *furcillifer* Bates, 1891 (BRT, RGNP)
89. *Onthophagus* (*Matashia*) *gracilipes* Boucomont, 1914 (BRT, RGNP)
90. *Onthophagus* (s.str.) *griseosetosus* Arrow, 1931 (S. Mysore, Kanara, BRT)
91. *Onthophagus* (*Micronthophagus*) *gulo* Arrow, 1931 (Belgaum)
92. *Onthophagus* (*Colobonthophagus*) *hindu* Arrow, 1931 (Bellary, Bangalore, BRT)
93. *Onthophagus* (*Micronthophagus*) *hystrix* Boucomont, 1914 (Belgaum)
94. *Onthophagus* (s.str.) *igneus* Vigors, 1825 (Bangalore, RGNP)
95. *Onthophagus* (s.str.) *kanarensis* Arrow, 1931 (North Kanara)
96. *Onthophagus* (s.str.) *kchatriya* Boucomont, 1914 (Bangalore, BRT, RGNP)
97. *Onthophagus* (s.str.) *laborans* Arrow, 1931 (Dharwar)
98. *Onthophagus* (s.str.) *laevigatus* (Fabricius, 1798) (Chickkaballapur, Bellary, BRT)
99. *Onthophagus* (s.str.) *lemniscatus* Gillet, 1924 (RGNP)
100. *Onthophagus* (*Furconthophagus*) *lilliputanus* Lansberge, 1883 (Kanara)
101. *Onthophagus* (s.str.) *ludio* Boucomont, 1914 (Belgaum, BRT)
102. *Onthophagus* (*Gibbonthophagus*) *luridipennis* Boheman, 1858 (RGNP)
103. *Onthophagus* (s.str.) *madoqua* Arrow, 1931 (BRT, RGNP)
104. *Onthophagus* (s.str.) *mauritii* Boucomont, 1919 (Chikkaballapura, BRT)
105. *Onthophagus* (*Colobonthophagus*) *metalliceps* Arrow, 1931 (Kanara)
106. *Onthophagus* (s.str.) *mopsus* (Fabricius, 1792) (BRT, RGNP)
107. *Onthophagus* (s.str.) *negligens* Walker, 1858 (Bangalore)
108. *Onthophagus* (s.str.) *pacificus* Lansberge, 1885 (Kanara)
109. *Onthophagus* (*Colobonthophagus*) *paliceps* Arrow, 1931 (RGNP)
110. *Onthophagus* (*Colobonthophagus*) *pardalis* (Fabricius, 1798) (Belgaum)
111. *Onthophagus* (s.str.) *parvulus* (Fabricius, 1798) (Belgaum, Dharwar, RGNP)
112. *Onthophagus* (s.str.) *politus* (Fabricius, 1978) (Belgaum, BRT, RGNP)
113. *Onthophagus* (s.str.) *porcus* Arrow, 1931 (RGNP)
114. *Onthophagus* (s.str.) *pusillus* (Fabricius, 1798) (BRT)
115. *Onthophagus* (s.str.) *pygmaeus* (Schaller, 1783) (Bangalore)
116. *Onthophagus* (*Colobonthophagus*) *quadridentatus* (Fabricius, 1798) (Bangalore, Belgaum, BRT, RGNP)

117. *Onthophagus* (*Colobonthophagus*) *ramosellus* Bates, 1891 (Bangalore)
118. *Onthophagus* (*Colobonthophagus*) *ramosus* (Wiedemann, 1823) (Belgaum, Kanara, Bangalore, BRT, RGNP)
119. *Onthophagus* (s.str.) *rana* Arrow, 1931 (BRT)
120. *Onthophagus* (*Serrophorus*) *rectecornutus* (Lansberge, 1883) (Chikmagalur, Bangalore, BRT, RGNP)
121. *Onthophagus* (*Parascatonomus*) *rudis* Sharp, 1875 (Dharwar)
122. *Onthophagus* (s.str.) *semicinctus* D'Orbigny, 1897 (BRT)
123. *Onthophagus* (s.str.) *socialis* Arrow, 1931 (Belgaum, Fraserpet, Coorg)
124. *Onthophagus* (s.str.) *spinifex* (Fabricius, 1781) (Belgaum, Chikballapur)
125. *Onthophagus* (s.str.) *suillus* Arrow, 1931 (S. Mysore)
126. *Onthophagus* (*Trichonthophagus*) *tarandus* Fabricius, 1792 (Belgaum, BRT, RGNP)
127. *Onthophagus* (*Colobonthophagus*) *tragus* (Fabricius, 1792) (Belgaum, RGNP)
128. *Onthophagus* (*Colobonthophagus*) *transcaspicus* Koenig, 1889 (BRT, RGNP)
129. *Onthophagus* (*Colobonthophagus*) *triceratops* Arrow, 1913 (BRT)
130. *Onthophagus* (*Parascatonomus*) *tricornis* (Wiedemann, 1823) (BRT, RGNP)
131. *Onthophagus* (s.str.) *tritinctus* Boucomont, 1914 (Nandidurg, BRT, RGNP)
132. *Onthophagus* (s.str.) *truncaticornis* (Schaller, 1783) (Belgaum, Dharwar, Mangalore, South Kanara, BRT, RGNP)
133. *Onthophagus* (s.str.) *turbatus* Walker, 1858 (Belgaum, Kanara, BRT, RGNP)
134. *Onthophagus* (s.str.) *unifasciatus* (Schaller, 1783) (Belgaum, Chikkaballapura, BRT)
135. *Onthophagus* (s. str.) *usurpator* Balthasar, 1960 (BRT, RGNP)
136. *Onthophagus* (*Parascatonomus*) *vividus* Arrow, 1907 (Nandidurg, Bangalore)
137. *Onthophagus* (s.str.) *vultur* Arrow, 1931 (Belgaum)
138. *Onthophagus* (s.str.) *zebra* Arrow, 1931 (Belgaum)

Genus 21. ***Proagoderus*** Lansberge, 1883

139. *Proagoderus imperator* Castelnau, 1840 (Belgaum, Kanara)
140. *Proagoderus pactolus* (Fabricius, 1787) (Mysore, Bangalore, BRT, RGNP)

Genus 22: ***Digitonthophagus*** Balthasar, 1959

141. *Digitonthophagus bonasus* (Fabricius, 1898) (Belgaum, Mysore, BRT, RGNP)
142. *Digitonthophagus gazella* (Fabricius, 1787) (Belgaum, BRT)

Genus 23 ***Phalops*** Erichson, 1848

143. *Phalops candezei* Lansberge, 1883 (Belgaum, Bellary, Bangalore)
144. *Phalops cyanescens* (D'Orbigny, 1897) (Bellary, Bangalore)
145. *Phalops divisus* (Wiedemann, 1823) (BRT)

Note 1 : *Delopleurus parvus* is a new Report to Karnataka.

Note 2 : Apart from these 145 species, another 22 species of the genus *Onthophagus* and 1 species of *Copris* in our collection are yet to be identified.

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INSECTA : DIPTERA : CECIDOMYIIDAE

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INTRODUCTION

Presently, the family *Cecidomyiidae* best known as plant gall makers or gall midges consists of four subfamilies *viz. Catotrichinae,* (not reported from India) *Lestremiinae, Porricondylinae* and *Cecidomyiinae.* The species belonging to second and third subfamilies are mycophagous, saprophagous, phytosaprophagous and xylophagous in nature. The subfamily *Cecidomyiinae* includes phytophagous (gall forming or non gall forming and inquilines), zoophagous or predatory species. Several phytophagous gall midges cause considerable damage to economically important agricultural / horticultural crops and have gained the status of serious pests.

The number of species of all Cecidomyiidae in the world at large and India in particular is still unknown and inestimable. Of the 6131 species and 783 genera of living and fossil gall midges known from the world (Gagné 2010), Indian diversity accounts for 398 described species belonging to 125 genera under three subfamilies (Sharma, 2009), which is approximately 6.5% of world diversity. Only 30 species of 24 genera under three subfamilies (7.10% of Indian diversity) are so far recorded from the state, Sharma (1993, 1999 & 2001).

Order DIPTERA

Suborder NEMATOCERA

Family CECIDOMYIIDAE

Subfamily LESTREMIINAE

Tribe **Lestremiini**

1. ***Anarete allahabadensis*** Grover, 1964, 1970

Host : Unknown.

Distribution : Karnataka: Nagarhole National Park.

2. ***Conarete calcuttaense*** (Nayar), 1949

Host : Unknown.

Distribution : Karnataka : Nagarhole National Park.

Tribe **Micromyini**

3. ***Monardia*** Subg. ***Xylopriona nilgiriensis*** Sharma, 1993

Host : Unknown.

Distribution : Karnataka: Nagarhole National Park.

Subfamily PORRICONDYLINAE

Tribe **Asynaptini**

4. ***Asynapta aurangabadensis*** Sharma, 1987

Host : Unknown.

Distribution : Karnataka: Nagarhole National Park.

Tribe **Porricondylini**

5. ***Claspettomyia indica*** Rao and Sharma, 1978

Host : Unknown.

Distribution : Karnataka: Nagarhole National Park.

6. ***Parepidosis trilobata*** Sharma and Rao, 1979

Host : Unknown.

Distribution: Karnataka: Nagarhole National Park.

7. ***Clinophaena longiptera*** (Nayar), 1949

Host : Unknown.

Distribution : Karnataka : Nagarhole National Park.

8. ***Rabindrodiplosis orientalis*** Sharma and Rao, 1980

Host : Unknown.

Distribution : Karnataka: Nagarhole National Park.

Subfamily CECIDOMYIINAE

Supertribe **Lasiopteridi**

Tribe **Lasiopterini**

9. ***Lasioptera achyranthesae*** Sharma, 1988

Host : *Achyranthes aspera* L. (Amaranthaceae).

Distribution : Karnataka: North Kanara.

10. ***Lasioptera tomentosae*** (Grover), 1967

Host : *Setaria intermedia* R.& S. (Poaceae).

Distribution : Karnataka: North Kanara.

Tribe **Dasineurini**

11. ***Dasineura gossypii*** Felt, 1916

Host : *Gossypium* sp. (Malvaceae)

Distribution : Karnataka : Dharwad

Supertribe : **Stomatosematidi**

12. ***Stomatosema vanchii*** (Nayar), 1949 ***(Vanchidiplosis)***

Host : Unknown.

Distribution: Karnataka: Nagarhole National Park.

Supertribe **Cecidomyiidi**

Tribe **Asphondyliini**

Subtribe **Asphondyliina**

13. ***Asphondylia phyllanthi*** Felt, 1920

Host : *Emblica officinalis* Gaerth (Euphorbiaceae).

Distribution : Karnataka : Nilgiris (5300 ft).

14. ***Asphondylia tectonae*** Mani, 1974

Host : *Tectona grandis* L. (Verbanaceae).

Distribution : Karnataka : Nagarhole National Park and wherever host plant exists in the state.

Tribe **Clinodiplosini**

15. ***Clinodiplosis indica*** (Rao), 1953 ***(Charidiplosis)***

Host : Unknown.

Distribution: Karnataka: Nagarhole National Park.

Tribe **Microdiplosini**

16. ***Coquillettomyia longipalpi*** (Rao), 1953 ***(Microplecus)***

Host : Unknown.

Distribution : Karnataka : Nagarhole National Park.

Tribe **Lestodiplosini**

17. ***Odontodiplosis jonesi*** (Nayar), 1949 ***(Lestodiplosis)***

Host : Unknown.

Distribution : Karnataka: Nagarhole National Park.

18. ***Odontodiplosis raoi*** Sharma, 1986

Host : Unknown.

Distribution : Karnataka: Nagarhole National Park.

Tribe **Cecidomyiini**

19. ***Cecidomyia artocarpi*** Felt, 1921

Host : Decaying *Artocarpus* sp. (Urticaceae).

Distribution : Karnataka : Nagarhole National Park.

20. ***Procontarinia matteina*** Kieffer and Cecconi, 1906

Host : *Mangifera indica* L. (Anacardiaceae).

Distribution : Throughout India including Karnataka

21. ***Stenodiplosis sorghicola*** (Coquillett), 1899

Host : *Sorghum bicolor* (L.) Moench, *Sorghum* spp. (Poaceae)

Distribution : Throughout India including Karnataka.

Unplaced to Tribe

22. ***Blastodiplosis longipennis*** Sharma, 1999

Host : Unknown. Type Locality: Nagarhole National Park (Karnataka).

23. ***Giardomyia indica*** Grover and Bakshi, 1978

Host : Unknown.

Distribution : Karnataka: Nagarhole National Park.

24. ***Octodiplosis brevipalpis*** Sharma, 1999

Host : Unknown. Type Locality : Nagarhole National Park (Karnataka)

25. ***Orseolia apludae*** (Felt), 1920

Host : *Apluda mutica* L. (= *varia* Hack) (Poaceae).

Distribution : Karnataka : Nagarhole National Park

26. ***Orseolia eragrostisae*** (Mani), 1936

Host : *Eragrostis amabilis* (= *E. tenella)* (L.) P. Beauv (Poaceae).

Type Locality : Mangalore (Karnataka).

27. ***Orseolia monticola*** (Felt), 1921

Host : *Chrysopogon fulvus* (Spr.) Chiov. (= *Andropogon monticola*) (Poaceae).

Type Locality : Muruvani, Mysore (Karnataka).

28. ***Orseolia oryzae*** (Wood-Mason), 1889

Host : *Oryza sativa* L.; *Oryza perrenis* Moench (nom. Illeg.) (Poaceae).

Distribution : Throughout India including Karnataka.

29. ***Triommata coccidivora*** (Felt), 1914

Host : *Ferrisia virgata* (Cockrell); *Macronellicoccus hirsutus* (Green); *Nipaecoccus vastator* (Maskell); *Pseudococcus virgatus* (Hemiptera : Pseudococcidae).

Distribution : Bihar, Karnataka, Kerala and Uttar Pradesh

30. ***Xylodiplosis kempi*** Mani, 1934

Host : Unknown. Type Locality: Castle Rock, North Kanara (Karnataka).

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Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 183-184, 2013

INSECTA : DIPTERA : TABANIDAE

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INTRODUCTION

The brachyceran flies commonly referred to as horse flies, deer flies or clegs are stout bodied, medium to large (5-33 mm in length) in size having capacity to fly swiftly. Adult flies are generally colourful, have a pair of large black, brown to green or yellow eyes with iridescent coppery red and green bands or spots in the living condition. Males have holoptic eyes which meet in the mid line whereas females have dichoptic eyes which are markedly separated. The antennae are porrect and horn-like. Wings are transparent or clouded, banded or striped or with mottled infuscations. The thorax and abdomen are usually striped or banded with various colours.

Tabanid flies are mostly diurnal except a few which are nocturnal. They are mostly exophilic and exophagic, enter the human habitations along with livestock. The adults of both sexes feed on nectar and pollen of flowers, honeydew or on plant juice. Most of the females also suck blood from vertebrate animals including man and transmit several pathogens. These flies are facultative haematophagous ectoparasites, thus important from medical and veterinary point of view. They are efficient mechanical carriers of various diseases are responsible for transmission of more than 25 animal diseases.

Indian fauna of Tabanid flies is represented by 240 species (Veer, 2004), of which, 27 species of 3 genera under two subfamilies are known from Karnataka State.

SYSTEMATIC LIST

Order DIPTERA

Suborder BRACHYCERA

Family TABANIDAE

Subfamily CHRYSOPSINAE

Tribe **Chrysopsini**

1. *Chrysops terminalis* Walker, 1848
   Distribution : Karnataka : Mysore

Subfamily TABANINAE

Tribe **Haematopotini**

2. *Haematopota adusta* Stone & Philip, 1974
   Distribution : Karnataka: Gersoppa, N.Kanara
3. *Haematopota albimedia* Stone & Philip, 1974
   Distribution: Karnataka: Shimoga, Bhagawati
4. *Haematopota brevis* Ricardo, 1906
   Distribution: Karnataka: Bangalore
5. *Haematopota cana* Walker, 1848
   Distribution: Karnataka: Belgaon
6. *Haematopota chvalai* Stone & Philip, 1974
   Distribution : Karnataka: Sidpur, Pillibeta (Coorg)
7. *Haematopota dissimilis* Ricardo, 1911
   Distribution : Karnataka : Basti, N. Kanara
8. *Haematopota echma* Stone & Philip, 1974
   Distribution : Karnataka : Coorg
9. *Haematopota hindostani* Ricardo, 1917
   Distribution : Karnataka : Bababuddin Hills
10. *Haematopota immaculata* Ricardo, 1911
    Distribution : Karnataka

11. *Haematopota inconspicua* Ricardo, 1911
    Distribution : Karnataka : Karwar, Kanara
12. *Haematopota limbata* Bigot-1891
    Distribution : Karnataka : Coorg
13. *Haematopota longipennis* Stone & Philip, 1974
    Distribution : Karnataka : Coorg
14. *Haematopota malbarica* Stone & Philip, 1974
    Distribution : Karnataka : Kanara
15. *Haematopota montana* Ricardo, 1917
    Distribution : Karnataka: Bababuddin Hills, Coorg

Tribe **Tabanini**

16. *Tabanus aurisegmentatus* Schuurmans Stekhoven, 1932
    Distribution : Karnataka : Kondo, Mysore
17. *Tabanus auristriatus* Ricardo, 1911
    Distribution : Karnataka : Gersoppa, Koonor
18. *Tabanus avittatus* Schuurmans Stekhoven, 1926
    Distribution : Karnataka : Belgaum
19. *Tabanus biannularis* Philip. 1960
    Distribution : Karnataka : Koonoor, N.Kanara, Pollibetta and Sampaji Ghat, Coorg
20. *Tabanus brunnipennis* Ricardo, 1911
    Distribution : Karnataka : Basti, Polibetta (Coorg)
21. *Tabanus crassus* Walker, 1850
    Distribution : Karnataka : Karwar
22. *Tabanus explicatus* Walker, 1854
    Distribution: Karnataka : Conoor
23. *Tabanus indianus* Ricardo, 1911
    Distribution : Karnataka : Kadra, Coorg
24. *Tabanus leucocnematus* Bigot, 1892
    Distribution : Karnataka : Conoor
25. *Tabanus leucohirtus* Ricardo, 1909
    Distribution : Karnataka : Kanara
26. *Tabanus tenebrosus* Walker, 1854
    Distribution : Karnataka : Kanara
27. *Tabanus tuberculatus* Ricardo, 1911
    Distribution : Karnataka : Vellupuram

SUMMARY

A checklist of 27 species belonging to 3 genera under two subfamilies of Tabanid flies recorded from Karnataka State is provided.

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Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 185-186, 2013

INSECTA : DIPTERA : PSYCHODIDAE (MOTH FLIES AND SAND FLIES)

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INTRODUCTION

The family Psychodidae is typically characterized by a small fly with the presence of dense hairs on the wings and bodies. Members of Psychodidae contain some of the archaic lower Diptera that are distributed in tropical and sub tropical countries. Psychodids includes traditionally the subfamily Phlebotomine sandflies (some of which are vectors of leishmaniasis) and non-Phlebotomine moth flies. Taxonomy of Psychodidae was of special interest to Dr Nelson Annandale, the founder Director of Zoological Survey of India but their cryptic biology and behavior, the knowledge of Indian psychodids is only partial with less than 100 known species. Brunetti (1912) recorded two species *Psychoda alternata* Say (= *Psychoda bengalensis* Brunetti) and *Trichopsychoda hitipennis* (Brunetti) from Bangalore in Karnataka state but as in many other states lacks a thorough taxonomic study of Psychodidae. However, Psychodid fauna of Karnataka comprises 23 species representing 10 genera and 2 subfamilies which are similar to the neighboring states of Tamil Nadu and Kerala (Ilango, 1990).

TAXONOMIC LIST

Family PSYCHODIDAE

Subfamily PSYCHODINAE (Moth flies)

1. *Telmatoscopus longichaetus* (Brunetti)
2. *Neotelmatoscopus ctenophours* Ilango
3. *Brunettia travancorica* Annandale
4. *Philosepedon decora* (Brunetti)
5. *Philosepedon distans* (Brunetti)
6. *Trichopsychoda hirtipennis* (Brunetti)
7. *Psychoda acanthostyla* Tokunaga
8. *Psychoda alabangensis* del Rosario
9. *Psychoda alternata* Say
10. *Psychoda pathenogenetica* Tonnoir
11. *Epacretron apicalis* Brunetti
12. *Epacretron impunctata* Brunetti

Subfamily PHLEBOTOMINAE (Sand flies)

13. *Grassomyia indica* (Theodor)
14. *Phlebotomus (Anaphlebotomus) colabaensis* Young & Chalam
15. *Phlebotomus (Euphlebotomus) argetipes* Annandale & Brunetti
16. *Phlebotomus (Phlebotomus) papatasi* Scopoli
17. *Sergentomyia (Parrotomyia) babu* Annandale
18. *Sergentomyia (Parrotomyia) insularis* Theodor
19. *Sergentomyia (Parrotomyia) yercaudensis* Ilango
20. *Sergentomyia (Sergentomyia) punjabensis* Sinton
21. *Sergentomyia (Sintonius) clydei* Sinton
22. *Sergentomyia bailyi* (nicni Group) (Sinton)
23. *Sergentomyia shettyi* (nicni Group) Ilango

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Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 187-189, 2013

INSECTA: DIPTERA: BOMBYLIIDAE

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INTRODUCTION

The bombyliids or "bee-flies" as they are commonly referred to are a group of moderate to large sized colourful flies constituting one of the large and diverse families of the suborder Brachycera. With over 4,500 described species from the world, 257 represent Oriental Region. The Indian bombyllid fauna stands at 138 species belonging to 36 genera under eight subfamilies (Evenhuis and Greathead, 1999; Mitra, 2008). So far, 42 species of 19 genera under three subfamilies are known from Karnataka State (Banerjee, *et al.*, 2006; Mitra, 2008).

These flies are most frequently found in arid and semiarid portions of the world, with a few specialized forms occurring in moist tropical climates. Adults are commonly found on flowers, hovering in bright sunlight, or resting on warm, bare ground. They show remarkable range in size (from 1.5 mm to more than 60 mm in length). In India, the members of this family are generally found from the vegetative parts of the high altitude areas of the Himalayas to the hot and arid zone of the Thar Desert and also from the cold desert of Ladakh to the sea coast of Andaman & Nicobar Islands.

Larvae of these flies are primarily parasitoids of holometabolous insects, thus very important group from economic point of view.

Order DIPTERA

Suborder BRACYCERA

Family BOMBYLIIDAE

Subfamily BOMBYLIINAE Latreille

Tribe **Bombyliini**

1. Genus ***Anastoechus*** Osten Sacken, 1877

1. ***Anastoechus bangalorensis*** Kapoor & Agarwal, 1979

Distribution: Karnataka

2. Genus ***Bombomyia*** Greathead, 1995

2. ***Bombomyia maculata*** Fabricius, 1775

Distribution: Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh, Orissa, Tamil Nadu, Uttarakhand.

3. ***Bombomyia tricolor*** Guerin -Meneville, 1835

Distribution: Bihar, Karnataka, Maharashtra, Tamil Nadu, Uttarakhand , West Bengal.

3. Genus ***Bombylella*** Greathead, 1995

4. ***Bombylella roonwali*** Zaitzev, 1988

Distribution: Karnataka

4. Genus ***Bombylisoma*** Rondani, 1856

5. ***Bombylisoma ghorpadei*** Kapoor & Agarwal, 1979

Distribution: Karnataka

5. Genus ***Bombylius*** Linnaeus, 1758

6. ***Bombylius (Bombylius) ardens*** Walker, 1849

Distribution: Karnataka

7. ***Bombylius (Bombylius) major*** Linnaeus, 1758

Distribution: Assam, Himachal Pradesh, Karnataka

8. ***Bombylius (Bombylius) propinquus*** (Brunetti, 1909)

Distribution: Karnataka

6. Genus ***Eurycarenus*** Loew, 1860

9. ***Eurycarenus erectus*** (Brunetti, 1909)

Distribution: Karnataka, Maharashtra

7. Genus ***Systoechus*** Loew, 1855

10. ***Systoechus flavospinosus*** Brunetti, 1920

Distribution: Karnataka

11. ***Systoechus socius*** Walker, 1852

Distribution: Andhra Pradesh, Bihar, Himachal Pradesh, Karnataka, Jammu & Kashmir, Sikkim, Tamil Nadu, Uttar Pradesh, Uttarakhand.

Subfamily CYTHEREINAE BECKER

8. Genus ***Amictus*** Wiedemann, 1817

12. ***Amictus bowdeni*** Kapoor&Agarwal

Distribution: Karnataka

Subfamily ANTHRACINAE Latreille

Tribe **Anthracini** Latreille

9. Genus ***Anthrax*** Scopoli, 1763

13. ***Anthrax distigma*** (Wiedemann, 1828)

Distribution: Andaman and Nicobar Islands, Arunachal Pradesh, Bihar, Chandigarh, Karnataka, Meghalaya, Sikkim, Tamil Nadu, Uttarakhand and West Bengal.

14. ***Anthrax obscurifrons*** Brunetti, 1909

Distribution:Himachal Pradesh, Karnataka

10. Genus ***Spogostylum*** Macquart, 1840

15. ***Spogostylum duvaucelli*** (Macquart, 1840)

Distribution: Andhra Pradesh, Bihar, Gujarat, Himachal Pradesh, Karnataka, Uttar Pradesh, West Bengal.

Tribe **Exoprosopini** Becker

11. Genus ***Collosoptera*** Hull, 1973

16. ***Collosoptera latipennis*** (Brunetti, 1909)

Distribution: Karnataka, Meghalaya

12. Genus ***Exoprosopa*** Macquart, 1840

17. ***Exoprosopa niveiventris*** Brunetti, 1909

Distribution: Karnataka, West Bengal

18. ***Exoprosopa puerula*** Brunetti, 1920

Distribution: Himachal Pradesh, Karnataka, Tamil Nadu, Uttar Pradesh

19. ***Exoprosopa tamerlan*** Portschinsky, 1887

Distribution: Bihar, Karnataka, Orissa

13. Genus ***Heteralonia*** Rondani, 1863

20. ***Heteralonia (Homolonia) bengalensis*** (Macquart, 1840)

Distribution: Bihar or West Bengal, Karnataka

21. ***Heteralonia(Homolonia) lateralis*** (Brunetti, 1909)

Distribution: Andhra Pradesh, Karnataka, Orissa, West Bengal.

22. ***Heteralonia (Isotamia) bangalorensis*** (Zaitzev, 1987)

Distribution: Karnataka

23. ***Heteralonia (Isotamia) bramha*** (Schiner, 1868)

Distribution: Karnataka, Tamil Nadu

24. ***Heteralonia (Isotamia) brunettii*** (Zaitzev, 1987)

Distribution: Karnataka

25. ***Heteralonia (Isotamia) insulata*** (Walker, 1852)

Distribution: Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chandigarh, Gujarat, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Punjab,Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh, West Bengal.

26. ***Heteralonia(Isotamia) lankiensis*** (Zaitzev, 1988)

Distribution: Karnataka

27. ***Heteralonia (Isotamia) maculiventris***

(Brunetti, 1920)

Distribution: Karnataka, Punjab, Uttarakhand

28. ***Heteralonia (Isotamia) mudigerensis*** (Zaitzev, 1987)

Distribution: Karnataka

29. ***Heteralonia (Isotamia) siva*** (Nurse, 1922)

Distribution: Himachal Pradesh, Karnataka, Maharashtra, Orissa, Tamil Nadu.

30. ***Heteralonia (Isotamia) stylata*** (Brunetti, 1920)

Distribution: Karnataka

31. ***Heteralonia (Isotamia) tarikerensis*** (Zaitzev, 1987)

Distribution: Karnataka

14. Genus ***Ligyra*** Newman, 1841

32. ***Ligyra flaviventris*** (Doeschall, 1857)

*Distribution:*Andaman Islands, Assam, Karnataka, Kerala, Sikkim.

33. ***Ligyra orientalis*** Paramonov, 1931

*Distribution:*Karnataka

34. ***Ligyra semifuscata*** (Brunetti, 1912)

*Distribution:*Andaman & Nicobar islands, Karnataka, Maharashtra.

Distribution: Karnataka, Punjab, Uttarakhand.

42. ***Petrorossia curvipennis*** Zaitzev, 1988

Distribution: Karnataka

35. ***Ligyra suffisipennis*** (Brunetti, 1909)

*Distribution:*Bihar, Kerala, Karnataka, Uttarakhand.

15. Genus ***Litorhina*** Bowden, 1975

36. ***Litorhina collaris*** (Wiedemann,1828)

Distribution:Karnataka, Rajasthan, Sikkim.

37. ***Litorhina lar*** (Fabricius, 1781)

Distribution:Andhra Pradesh , Arunachal Pradesh , Assam, Bihar, Chandigarh, Gujarat, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal.

16. Genus ***Micomitra*** Bowden, 1964

38. ***Micomitra vitripennis*** Brunetti, 1912

*Distribution:*Karnataka, Maharashtra.

17. Genus ***Exhyalanthrax*** Becker, 1916

39. ***Exhyalanthrax compactus*** (Brunetti, 1920)

*Distribution:*Karnataka, Uttar Pradesh

18. Genus ***Villa*** Lioy, 1864

40. ***Villa fletcheri*** (Brunetti, 1920)

Distribution: Karnataka

Tribe **Xeramoebini** Hull

19. Genus ***Petrorossia*** Bezzi, 1908

41. ***Petrorossia claripennis*** (Brunetti, 1909)

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Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 191-192, 2013

INSECTA : DIPTERA : CALLIPHORIDAE

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INTRODUCTION

Members of the family Calliphoridae are commonly known as blow flies or blue, brown or green bottle flies. They are small to large, robustly-built, metallic blue-green, and covered more or less with dusting. Adults frequent vegetation, flowers, excrement, or decaying animal and plant matter. Larvae are omnivorous, carnivorous, or parasitic. They are known to be either primary scavengers feeding in carrion, faeces, dung, and garbage, or parasites on insects, earthworms, snails, mammals, or other animals. Blow flies are of great medical, veterinary and forensic importance because of their breeding and feeding habits. With approximately 1100 described species world-wide Indian representatives belong to 120 species under 30 genera (Nandi, 2004; Singh & Sidhu, 2004 & 2007; Ronges, 2009). Blow flies fauna of Karnataka is poorly studied, only 16 species of 10 genera are so far known.

Order DIPTERA

Suborder BRACHYCERA

Superfamily OESTROIDEA

Family CALLIPHORIDAE

Subfamily BENGALIINAE

Tribe **Bengaliini**

1. Genus ***Bengalia*** Robineau-Desvoidy, 1830

1. *Bengalia jejuna* (Fabricius, 1794) Karnataka : Kaimara
2. *Bengalia surcoufi* Senior-White, 1923 Karnataka: Bangalore, Kaimara

Subfamily LUCILIINAE

Tribe **Luciliini**

2. Genus ***Lucillia*** Robineau-Desvoidy, 1830
3. *Lucillia cuprina* (Wiedemann, 1830) : All over India
4. *Lucillia sericata* (Meigen, 1826) : All over India
5. *Lucillia porphyrina* (Walker, 1856) : All over India

Subfamily POLLENIINAE

Tribe **Polleniini**

3. Genus ***Pollenia*** Robineau-Desvoidy, 1830
6. *Pollenia rudis* (Fabricius, 1794) : All over India

Subfamily CHRYSOMYINAE

Tribe **Chrysomyini**

4. Genus ***Chrysomya*** Robineau-Desvoidy, 1830
7. *Chrysomya megacephala* (Fabricius, 1794) : All over India
8. *Chrysomya pinguis* (Walker, 1858) : All over India
9. *Chrysomya rufifacies* Macquart, 1842 : All over India

Subfamily RHINIINAE

Tribe **Rhiniini**

5. Genus ***Idiella*** Braeuer and Berensteamn, 1889
10. *Idiella mandarina* (Wiedemann, 1830) : All over India

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6. Genus ***Idiellopsis*** Townsend, 1917

11. *Idiellopsis xanthogaster* (Wiedemann, 1820) : All over India

7. Genus ***Rhinia*** Robineau-Desvoidy, 1830

12. *Rhinia apicalis* (Wiedemann, 1830) : All over India

8. Genus ***Stomorhina*** Rondani, 1861

13. *Stomorhina discolor* (Fabricius, 1794) : All over India

Tribe **Cosminini**

9. Genus ***Cosmina*** Robineau-Desvoidy, 1830

14. *Cosmina bicolor* (Walker, 1856) : Karnataka : Bangalore

15. *Cosmina prasina* (Brauer-Bergenstamm, 1889): All over India

Tribe **Rhyncomyiini**

10. Genus ***Rhyncomya*** Robineau-Desvoidy, 1830

16. *Rhyncomya divisa* (Walker, 1853) : All over India

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Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 193-194, 2013

INSECTA : DIPTERA : SARCOPHAGIDAE

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INTRODUCTION

The members of the family Sarcophagidae are commonly known as 'flesh flies'. Adult flies measure in length from 4 mm to 18 mm. Body grayish to black with three black stripes on the thorax. The abdomen has a light and dark gray checkerboard pattern and is often red at the tip. Although the name would seem to indicate a habit of breeding in vertebrate carcases, this is by no means typical for the family, which includes specialists ranging from inhabitants of pitcher plants to bat coprophages, crab saprophages, wasp nest inquilines, and insect parasitoids. With nearly 2600 described species world-wide (Pape et al, 2009) Indian representatives belong to 117 species under 38 genera spread over three subfamilies (Nandi, 2002). So far, 27 species under 16 genera of flesh flies are known from the Karnataka State.

Order DIPTERA

Suborder CYCLORRHAPHA

Family SARCOPHAGIDAE

Subfamily MILTOGRAMMATINAE Brauer & Bergenstamm

Tribe **Miltogrammatini** Brauer & Bergenstamm

Subtribe **Senotainiina** Rohdendorf

1. Genus ***Senotainia*** Macquart, 1846

Subgenus ***Chaetometopia*** Malloch, 1930

1. *Senotainia (Chaetometopia) cinerea* (Malloch, 1930) : Karnataka : Midigare

Tribe **Phyllotelini** Rohdendorf

Subtribe **Hoplocephalina** Rohdendorf

2. Genus ***Krombeinomyia*** Verves, 1979

2. *Krombeinomyia mirabilis* Verves, 1979 : Karnataka: Bannerghatta

Tribe **Metopiini** Rohdendorf

Subtribe **Metopiina** Rohdendorf

3. Genus ***Metopia*** Meigen, 1803

Subgenus ***Australoanicia*** Verves, 1979

3. *Metopia (Australoanicia) nudibasis* (Malloch, 1930) : Karnataka: Bannerghatta

Subfamily SARCOPHAGINAE Macquart

Tribe **Protodexiini** Townsend

4. Genus ***Blaesoxipha*** Loew, 1861

Subgenus ***Blaesoxipha*** Loew, 1861

4. *Blaesoxipha (Blaesoxipha) aldrichi* Nandi, 1992 : Karnataka: Kaimara

5. *Blaesoxipha (Blaesoxipha) karanataka* Pape, 1994 : Karnataka : Kemmagundi

6. *Blaesoxipha (Blaesoxipha) valangae* (Aldrich) : Karnataka: Bangalore

Tribe **Sarcophagini** Macquart

Subtribe **Parasarcophagina** Rohdendorf

5. Genus ***Bercaea*** Robineau-Desvoidy, 1863

7. *Bercaea cruentata* (Meigen , 1826) : All over India

6. Genus ***Boettcherisca*** Rohdendorf, 1937

8. *Boettcherisca peregrina* (Robineau-Desvoidy, 1830) : All over India

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7. Genus ***Fengia*** Rohdendorf, 1964

9. *Fengia kaimaraensis* Nandi, 1992 : Karnataka : Kaimara

8. Genus ***Parasarcophaga*** Johnston & Teigs, 1921

Subgenus ***Liopygia*** Enderlein, 1928

10. *Parasarcophaga (Liopygia) ruficornis* (Fabricius, 1794) : Karnataka : common

Subgenus ***Liosarcophaga*** Enderlein, 1928

11. *Parasarcophaga (Liosarcophaga) amplicercus* Shinonaga & Tumrasvin, 1979 : Karnataka (Bandipur)

12. *Parasarcophaga (Liosarcophaga) dux* (Thomson, 1869) : Karnataka : common

Subgenus ***Curranea*** Rohdendorf, 1937

13. *Parasarcophaga (Curranea) scopariiformis* (Senior-White, 1927) : Karnataka : common

Subgenus ***Pandelleisca*** Rohdendorf, 1937

14. *Parasarcophaga (Pandelleisca) ballardi* (Senior-White, 1924) : Karnataka: Mysore

15. *Parasarcophaga (Pandelleisca) kurahashii* Nandi, 1992 : Karnataka: Mysore

Subgenus ***Parasarcophaga*** Johnston & Tiegs, 1921

16. *Parasarcophaga (Parasarcophaga) albiceps* (Meigen, 1826) : Karnataka : common

9. Genus ***Robineauella*** Enderlein, 1928

Subgenus ***Robineauella*** Enderlein, 1928

17. *Robineauella (Robineauella) walayari* (Senior-White, 1924) : Karnataka : Nandi Hills

10. Genus ***Sarcorohdendorfia*** Baranov, 1938

18. *Sarcorohdendorfia mysorensis* Nandi, 1988 : Karnataka : Mysore, Belur, Chikmangalore

11. Genus ***Sarcosolomonia*** Baranov, 1938

Subgenus ***Parkerimyia*** Lopes & Kano, 1969

19. *Sarcosolomonia (Parkerimyia) andamanensis* Nandi, 1989 : Karnataka : Kaimara

Subtribe **Helicophagellina** Lopes *et al.*

12. Genus ***Thyrsonema*** Enderlein, 1928

Subgenus ***Pseudothyrsocnema*** Rohdendorf, 1937

20. *Thyrsocnema (Pseudothyrsocnema) indica* Shinonaga & Lopes, 1975 : Karnataka: Kemangundi hills, Mudigare

13. Genus ***Pierretia*** Robineau-Desvoidy, 1863

Subgenus ***Asceloctella*** Enderlein, 1928

21. *Pierretia (Asceloctella) calicifera* (Böettcher, 1912) : Karnataka: common

Subtribe **Hapragophallina** Rohdendorf

14. Genus ***Harpagophalla*** Rohdendorf, 1937

22. *Harpagophalla kempi* (Senior-White, 1924) : Karnataka : common

15. Genus ***Iranihindia*** Rohdendorf, 1961

23. *Iranihindia futilis* (Senior-White, 1924) : Karnataka: common

24.*Iranihindia jamesi* Nandi, 1979 : Karnataka : Bangalore

25. *Iranihindia martellata* (Senior-White, 1924) : Karnataka : common.

26. *Iranihindia martellatoides* (Baranov, 1931) : Karnataka: common

Subtribe **Seniorwhiteina** Rohdendorf

16. Genus ***Seniorwhitea*** Rohdendorf, 1937

27. *Seniorwhiatea reciproca* (Walker, 1856) : Karnataka: common

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Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 195-196, 2013

INSECTA : SIPHONAPTERA

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INTRODUCTION

Adult fleas are bloodsucking ectoparasites of mammals and to a lesser extent, birds. The larvae undergo a holometabolous type of development and generally are not found on the host animal. They ordinarily utilize organic debris as food. Adults range in length from 1-10 mm but most are less than 5 mm. The body is laterally compressed giving a distinct flattened appearance. Wings are absent; antennae are short, 3-segmented usually fit into grooves on the head. The piercing and sucking mouthparts are enclosed within a beak. Most fleas require blood to reproduce and majority of the species infest mammals like rabbits, rats, mice, squirrels and other rodents. Birds, bats, pigs, dogs, cats and humans are also hosts. Many species of the fleas transmit diseases to their hosts thus important from health point of view. Worldwide more than 2000 species and 550 subspecies under 18 families are known (Catalogue of Life, 2009; Medvedev *et al.*, 2003; Parhost, 2005). The Indian fleas fauna is represented by 46 species and 5 subspecies belonging to 24 genera under 8 families (Sharma, 2010).

A perusal literature reveals that the following fourteen species of seven genera under three families are reported from the State.

Order SIPHONAPTERA Latreille, 1825

Infraorder PULICOMORPHA Medvedev, 1998

Superfamily PULICOIDEA Billberg, 1820

Family PULICIDAE Billberg, 1820

Subfamily PULICINAE Billberg, 1820

Tribe **Pulicini** Billberg, 1820

1. Genus ***Echidnophaga*** Olliff, 1886

1. *Echidnophaga gallinacea* (Westwood, 1875)

Distribution : All over India

2. Genus ***Pulex*** Linnaeus, 1758

Subgenus ***Pulex*** Linnaeus, 1758

2. *Pulex irritans* Linnaeus, 1758

Distribution : All over India

Subfamily ARCAEOPSYLLINAE Oudemans, 1909

Tribe **Arcaeopsyllini** Oudemans, 1909

3. Genus ***Ctenocephalides*** Stiles et Collins, 1930

3. *Ctenocephalides canis* (Curtis, 1826)

Distribution : All over India

4. *Ctenocephalides felis* (Bouche, 1835)

Distribution : All over India

5. *Ctenocephalides orientis* (Jordan, 1925)

Distribution : All over India

Subfamily XENOPSYLLINAE Glinkiewicz, 1907

Tribe **Xenopsyllini** Glinkiewicz, 1907

4. Genus ***Pariodontis*** Jordan et Rothschild, 1908

6. *Pariodontis riggenbachi* (Rothschild, 1904)

Distribution : All over India

5. Genus ***Xenopsylla*** Glinkiewicz, 1907

7. *Xenopsylla astia* Rothschild, 1911

Distribution : All over India

8. *Xenopsylla brasiliensis* (Baker, 1904)

Distribution : All over India

9. *Xenopsylla cheopis* (Rothschild, 1903)

Distribution : All over India

Infraorder PYGIOPSYLLOMORPHA Medvedev, 1998

Superfamily PYGIOSYLLOIDEA Wagner, 1939

Family STIVALIIDAE Mardon, 1978

6. Genus ***Stivalius*** Jordan et Rothschild, 1922

10. *Stivalius ahalae* (Rothschild, 1904)

Distribution : Karnataka, Tamil Nadu

11. *Stivalius aporus* Jordan et Rothschild, 1922

Distribution : Karnataka, Tamil Nadu

Infraorder CERATOPHYLLOMORPHA Medvedev, 1998

Superfamily CERATOPHYLLOIDEA Dampf, 1908

Family CERATOPHYLLIDAE Dampf, 1908

7. Genus ***Nosopsyllus*** Jordan, 1933

Subgenus ***Nosopsyllus*** Jordan, 1933

12. *Nosopsyllus alladinis* (Rothschild, 1904)

Distribution : Karnataka

13. *Nosopsyllus arcotus* (Jordan et Rothschild, 1921)

Distribution : Karnataka, Tamil Nadu

14. *Nosopsyllus argutus* (Jordan et Rothschild, 1921)

Distribution : Karnataka

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Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 197-206, 2013

INSECTA : LEPIDOPTERA: RHOPALOCERA

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Butterflies have been the subject of interest to both amateurs and professionals for a long time. The butterfly fauna of the Karnataka has been studied by British naturalists more than a century ago. Aitken, 1887, Davidson & Aitken, 1890, Davidson *et al*, 1896, Bell (1909-1927) published a series of articles on the butterflies of northern Western Ghats and Kanara region of the central Western Ghats in the journal Bombay Natural History Society. They listed 290 species from Western Ghats, mainly from north Kanara district of Karnataka and some part of Maharashtra. Watson (1890) published a comprehensive list of butterflies recorded from the then Mysore state covering some important districts like Shimoga, Hassan, Chickmagalore and Mysore in Karnataka. The Coorg area of the Western Ghats was thoroughly explored by many workers (Hannyngton, 1916& 1918; Winchworth, 1928; Yates, 1929, 1931, 1932 & 1933; Home, 1934). They listed around 250 butterfly species from the Coorg and adjoining Brahmagiri mountains. In the recent past many studies (Larsen, 1987-88; Geetha *et al,* 2000; Radhakrishnan and Lakshminarayana, 2001, Mohandas, 2004; Radhakrishnan and Palot, 2006 & 2007 and Ali *et al.* 2007) on the butterfly fauna of the Karnataka has been published.

Most significant work on the butterfly fauna for the entire Western Ghats region was made by Harish Gaonkar (1996) of Copenhagen Zoological Museum, Denmark. In his work he included 313 species of butterflies so far known from the Karnataka. However, the most recent compilation of all butterfly species of Western Ghats has been done by Krishnamegh Kunte (2006). In his list of 332 species of Western Ghats, 318 are recorded from Karnataka.

Altogether 318 species under 166 genera belong to 5 families recorded by Kunte (2006) from Karnataka. The family Lycaenidae dominated with 98 species followed by Nymphalidae (92 species), Hesperiidae (80 species), Pieridae (29 species) and 19 species from the family Papilionidae. Thirty three species are endemic to the Western Ghats (Table-1). Five species such as the Blue Nawab, *Eriboea schreiberi*, Blue Nawab, *Euthalia telchinia*, Danaid Eggfly, *Hypolimnas misippus*, Malabar-banded Swallowtail, *Papilio liomedon* and the Crimson Rose, *Pachliopta hector* are listed in the Schedule-I of the Indian Wildlife (Protection) Act. 38 species from Karnataka is in Schedule-II and 7 species in the Schedule-IV of the Act. Nomenclature followed after Gaonkar (1996) and the English Common Name is adopted from Wynter- Blyth (1957).

Table-1: Endemic butterflies of the Western Ghats reported from Karnataka

Sl.No.	Scientific Name	Common Name	Remarks
1	*Troides minos*	Southern Birdwing	
2	*Pachliopta pandiyana*	Malabar Rose	
3	*Papilio liomedon*	Malabar Banded Swallowtail	
4	*Papilio dravidarum*	Malabar Raven	
5	*Papilio buddha*	Buddha Peacock	
6	*Eurema nilgiriensis*	Nilgiri Grass Yellow	Recorded only from Kerala, Karnataka & Tamil Nadu
7	*Colias nilgiriensis*	Nilgiri Clouded Yellow	
8	*Appias wardii*	Lesser Albatross	
9	*Parantirrhoea marshallii*	Travancore Evening Brown	Kerala, Karnataka & Tamil nadu
10	*Mycaesis igilia*	Small Long-Brand Bushbrown	
11	*Mycalesis orcha*	Pale- Brand Bushbrown	
12	*Mycaleis adolphei*	Red Eye Bushbrown	Recorded only north of Palghat gap
13	*Zipoetis saitis*	Tamil Cat's Eye	
14	*Ypthima chenui*	Nilgiri Fourring	
15	*Parantica nilgiriensis*	Nilgiri Tiger	
16	*Idea malabarica*	Malabar Tree Nymph	
17	*Tarucus indica*	Indian Pierrot	
18	*Celatoxia albidisca*	White disc Hedge Blue	
19	*Arhopala alea*	Indian Oakblue	
20	*Spindasis abnormis*	Abnormal Silverline	
21	*Curetis siva*	Shiva Sunbeam	
22	*Sarangesa purendra*	Spotted Small Flat	
23	*Aereomachus pygmaeus*	Pygmy Scrub Hopper	
24	*Sovia hyrtacus*	Bicolured Ace	
25	*Thoressa honorei*	Madras Ace	
26	*Thoressa astigmata*	Unbranded Ace	
27	*Thoressa sitala*	Sitala Ace	
28	*Thoressa evershedi*	Evershed's Ace	
29	*Arnetta vindhiana*	Vindhyan Bob	
30	*Quedara basiflava*	Yellow Base Tree Flitter	
31	*Oriens concinna*	Tamil Dartlet	
32	*Caltoris canaraica*	Canara Dartlet	
33	*Arnetta mercara*	Mercara Dartlet	

SYSTEMATIC ACCOUNT

Order LEPIDOPTERA

Sub Order RHOPALOCERA

Family PAPILIONIDAE

Subfamily PAPILIONINAE

01. Spot Swordtail, *Pathysa nomius* (Esper)
02. Fivebar Swordtail, *Pathysa antiphates* (Cramer)
03. Common Jay, *Graphium doson* (C. & R. Felder)
04. Tailed Jay, *Graphium agamemnon* (Linnaeus)
05. Common Bluebottle, *Graphium sarpedon* (Linnaeus)
06. Common Rose, *Pachliopta aristolochiae* (Fabricius)
07. Crimson Rose, *Pachliopta hector* (Linnaeus)
08. Malabar Rose, *Pachliopta pandiyana* (Moore)
09. Southern Birdwing, *Troides minos* (Cramer)
10. Common Mime, *Papilio (Chilasa) clytia*, Linnaeus
11. Malabar Banded Swallowtail, *Papilio liomedon* (Moore)
12. Blue Mormon, *Papilio polymnestor* (Cramer)
13. Red Helen, *Papilio helenus* (Linnaeus)
14. Common Mormon, *Papilio polytes* (Linnaeus)
15. Malabar Raven, *Papilio dravidarum* (Wood-Mason)
16. Lime Butterfly, *Papilio demoleus* (Linnaeus)
17. Common Banded Peacock, *Papilio crino* (Fabricius)
18. Malabar Banded Peacock, *Papilio buddha* (Westwood)
19. Paris Peacock, *Papilio paris* (Linnaeus)

Family PIERIDAE

Subfamily PIERINAE

20. Indian Cabbage White, *Pieris canidia* Linnaeus
21. Pioneer(Caper White), *Anaphaeis aurota* Fabricius
22. Common Gull, *Cepora nerissa* Fabricius
23. Lesser Gull, *Cepora nadina* Lucas
24. White Orange Tip, *Ixias marianne* Cramer
25. Yellow Orange Tip, *Ixias pyrene* Linnaeus
26. Common Jezebel, *Delias eucharis* Drury
27. Painted Sawtooth, *Prioneris sita* C. Felder
28. Plain Puffin, *Appias indra* Moore
29. Striped Albatross, *Appias libythea* Fabricius
30. Chocolate Albatross, *Appias lyncida* Cramer
31. Common Albatross, *Appias albina* Felder
32. Lesser Albatross, *Appias wardii* (Moore)
33. Psyche, *Leptosia nina* Fabricius
34. Great Orange-Tip, *Hebomoia glaucippe* Linnaeus
35. Small Salmon Arab, *Colotis amata* Fabricius
36. Large Salmon Arab, *Colotis fausta* (Olivier)
37. Small Orange-Tip, *Colotis etrida* Boisduval
38. Plain Orange-Tip, *Colotis eucharis* Fabricius
39. Crimson-Tip, *Colotis danae* (Fabricius)
40. Dark Wanderer, *Pareronia ceylanica* (C. & R. Felder)
41. Common Wanderer, *Pareronia valeria* (Cramer)
42. Common Emigrant, *Catopsilia pomona* Fabricius
43. Mottled Emigrant, *Catopsilia pyranthe* Latreille
44. Small Grass Yellow, *Eurema brigitta* Cramer
45. Spotless Grass Yellow, *Eurema laeta* Boisduval
46. Common Grass Yellow, *Eurema hecabe* Linnaeus
47. Three-Spot Grass Yellow, *Eurema blanda* Boisduval
48. Nilgiri Clouded Yellow, *Colias nilgiriensis* Felder & Felder

Family NYMPHALIDAE

Subfamily LIBYTHEINAE

49. Common Beak *Libythea lepita* (Moore)
50. Club Beak *Libythea myrrha*(Godart)

Subfamily DANAINAE

51. Glassy Tiger, *Parantica aglea* (Stoll)
52. Nilgiri Tiger, *Parantica nilgiriensis* (Moore)
53. Dark Blue Tiger, *Tirumala septentrionis* (Butler)
54. Blue Tiger, *Tirumala limniace* Cramer
55. Plain Tiger, *Danaus chrysippus* Linnaeus
56. Common Or Striped Tiger, *Danaus genutia* Cramer
57. Common Indian Crow, *Euploea core* (Cramer)
58. Double-Branded Crow, *Euploea sylvester* (Fabricius)
59. Brown King Crow, *Euploea klugii* Moore
60. Malabar Tree Nymph, *Idea malabarica* Moore

Subfamily CHARAXINAE

61. Tawny Rajah *Charaxes bernardus* (Fabricius)
62. Black Rajah *Charaxes solon* (Fabricius)
63. Blue Nawab *Polyura schreiberi* (Godart)
64. Common Nawab *Polyura athamas* (Drury)
65. Anomalous Common Nawab *Polyura agraria* Swinhoe

Subfamily MORPHINAE

66. Southern Duffer Discophora lepida (Moore)

Subfamily SATYRINAE

67. Whitebar Bushbrown *Mycalesis anaxias* Hewitson
68. Small Longbrand Bushbrown *Mycalesis igilia* Fruhstorfer
69. Long-Brand Bushbrown *Mycalesis visala* Moore
70. Pale-brand Bushbrown *Mycalesis khasia* Evans
71. Redeye Bushbrown *Mycalesis adolphei* (Guérin-Ménéville)
72. Gladeye Bushbrown, *Mycalesis patnia* Moore
73. Tamil Bushbrown *Mycalesis subdita* Moore
74. Common Bushbrown *Mycalesis perseus* (Fabricius)
75. Dark Branded Bushbrown *Mycalesis mineus* (Linnaeus)
76. Common Treebrown *Lethe rohria* (Fabricius)
77. Tamil Treebrown *Lethe drypetis* (Hewitson)
78. Bamboo Treebrown *Lethe europa* (Fabricius)
79. Common Threering *Ypthima asterope* (Klug)
80. Jewel Fourring *Ypthima avanta* Moore
81. Common Fivering *Ypthima baldus* (Fabricius)
82. White Fourring *Ypthima ceylonica* Hewitson
83. Nilgiri Fourring *Ypthima chenui* (Guérin-Méneville)
84. Common Fourring *Ypthima huebneri* Kirby
85. Baby Fivering *Ypthima philomela* (Linnaeus)
86. Tamil Catseye *Zipaetis saitis* Hewitson
87. Nigger *Orsotriaena medus* (Fabricius)
88. Common Evening Brown *Melanitis leda* (Linnaeus)
89. Dark Evening Brown *Melanitis phedima* (Cramer)
90. Great Evening Brown *Melanitis zitenius* (Herbst)
91. Travancore Evening Brown *Parantirrhoea marshalli* Wood-Mason
92. Common Palmfly *Elymnias hypermnestra* (Linnaeus)

Subfamily HELICONIINAE

93. Cruiser *Vindula erota* Fabricius
94. Tamil Yeoman *Cirrochroa thais* (Fabricius)
95. Rustic *Cupha erymanthis* (Drury)
96. Small Leopard *Phalanta alcippe* Stoll
97. Leopard *Phalanta phalantha* Drury
98. Indian Fritillary *Argynnis hyperbius* Linnaeus
99. Tamil Lacewing *Cethosia nietneri* Felder & Felder

Subfamily ACRAEINAE

100. Tawny Coster *Acraea terpsicore* (Linnaeus)

Subfamily LIMENITIDINAE

101. Commander *Limenitis procris* (Cramer)

102. Common Sergeant *Athyma perius* (Linnaeus)
103. Blackvein Sergeant *Athyma ranga* Moore
104. Staff Sergeant, *Athyma selenophora* (Kollar)
105. Colour Sergeant, *Athyma nefte* (Cramer)
106. Common Lascar *Pantoporia hordonia* (Stoll)
107. Extra Lascar *Pantoporia sandaka* (Butler)
108. Common Sailer *Neptis hylas* Linnaeus
109. Shortbanded Sailer *Neptis columella* Moore
110. Chestnut-Streaked Sailer *Neptis jumbah* Moore
111. Yellowback Sailer *Neptis viraja* Evans
112. Sullied Sailer *Neptis soma* Eliot
113. Clear Sailer *Neptis nata* Moore
114. Southern Sullied Sailer *Neptis clinia* Moore
115. Clipper *Parthenos sylvia* (Cramer, 1775)
116. Common Baron *Euthalia aconthea* (Cramer)
117. Gaudy Baron *Euthalia lubentina* (Cramer)
118. Baronet *Euthalia nais* (Forster)
119. Blue Baron *Euthalia telchinia* (Ménétriés)
120. Grey Count *Tanaecia lepidea* (Butler)
121. Redspot Duke *Dophla evelina* (Stoll)

Subfamily CYRESTINAE

122. Common Map *Cyrestis thyodamas* Boisduval, 1836

Subfamily BIBLIDINAE

123. Angled Castor *Ariadne ariadne* Linnaeus
124. Common Castor *Ariadne merione*(Cramer)
125. Joker *Byblia ilithyia* (Drury)

Subfamily APATURINAE

126. Black Prince *Rohana parisatis* (Westwood)
127. Painted Courtesan *Euripus consimilis* (Westwood)

Subfamily NYMPHALINAE

128. Indian Red Admiral *Vanessa indica* (Herbst)
129. Painted Lady *Vanessa cardui* (Linnaeus)
130. Blue Admiral *Kaniska canace* (Linnaeus)
131. Gray Pansy *Junonia atlites* (Linnaeus)
132. Peacock Pansy *Junonia (Precis) almana* (Linnaeus)
133. Yellow Pansy *Junonia (Precis) hierta* (Fabricius)
134. Chocolate Pansy, *Junonia (Precis) iphita* (Cramer)
135. Lemon Pansy *Junonia (Precis) lemonias* (Linnaeus)
136. Blue Pansy *Junonia orithya* (Linnaeus)
137. Great Eggfly *Hypolimnas bolina* (Linnaeus)
138. Danaid Eggfly *Hypolimnas misippus* (Linnaeus)
139. South Indian Blue Oakleaf *Kallima horsfieldi* Kollar
140. Autumnleaf *Doleschallia bisaltide malabarica* (Cramer)

Family LYCAENIDAE

141. Plum Judy, *Abisara echerius* (Moore)
142. Mottle *Logania distanti* Semper
143. Apefly *Spalgis epius* (Westwood)
144. Red Pierrot *Talicada nyseus* Guérin
145. Common Pierrot *Castalius rosimon* Fabricius
146. Dark Pierrot *Castalius ananda* de Nicéville
147. Angled Pierrot *Caleta caleta* Hewitson
148. Banded Blue Pierrot *Discolampa ethion* Westwood
149. Spotted Pierrot *Tarucus callinara* Butler
150. Striped Pierrot *Tarucus nara* Kollar
151. Indian Pierrot *Tarucus indica* Evans
152. Zebra Blue *Syntarucus plinius* (Fabricius)
153. Bright Babul Blue *Azanus ubaldus* Cramer
154. Dull Babul Blue *Azanus uranus* Butler
155. African Babul Blue *Azanus jesous* Guérin-Meneville
156. Quaker *Neopithecops zalmora* Butler
157. Malayan *Megisba malaya* (Horsfield)
158. Plain Hedge Blue *Celastrina lavendularis* (Moore)
159. Common Hedge Blue *Acytolepis puspa* (Horsfield)
160. Hampson's Hedge Blue *Acytolepis lilacea* (Hampson)
161. White Hedge Blue *Akasinula akasa* (Horsfield)
162. Whitedisc Hedge Blue *Cyaniris albidisca* Moore

163. Lime Blue *Chilades laius* (Cramer)
164. Indian Cupid *Chilades parrhasius* (Fabricius)
165. Small Cupid *Chilades contracta* (Butler)
166. Dark Grass Blue *Zizeeria lysimon* (Hübner)
167. Lesser Grass Blue *Zizeeria otis* (Fabricius)
168. Pale Grass Blue *Pseudozizeeria maha* (Kollar)
169. Tiny Grass Blue *Zizula gaika* (Trimen)
170. Grass Jewel *Freyeria trochylus* (Freyer)
171. Gram Blue *Euchrysops cnejus* (Fabricius)
172. Plains Cupid *Edales pandava* (Horsfield)
173. Ciliate Blue *Anthene emolus* (Godart)
174. Pointed Ciliate Blue *Anthene lycaenina* (C. Felder)
175. Forget-me-not *Catochrysops strabo* (Fabricius)
176. Silver Forget-me-not *Catochrysops panormus* (C. Felder)
177. Peablue *Lampides boeticus* (Linnaeus)
178. Dark Cerulean *Jamides bochus* Stoll
179. Common Cerulean *Jamides celeno* (Cramer)
180. Metallic Cerulean *Jamides alecto* (Felder)
181. Large Four-line Blue *Nacaduba pactolus* (Felder)
182. Pale Four-line Blue *Nacaduba hermus* (Felder)
183. Pointed Lineblue *Nacaduba helicon* Felder
184. Transparent Six-line Blue *Nacaduba kurava* (Moore)
185. Opaque Six-line Blue *Nacaduba beroe* (Felder & Felder)
186. Rounded Six-line Blue *Nacaduba berenice* (Herrich-Schäffer)
187. Dark Ceylon Six-line Blue *Nacaduba calauria* (C. Felder)
188. Common Lineblue *Prosotas nora* (Felder)
189. Tailless Lineblue *Prosotas dubiosa* (Semper)
190. White-tipped Lineblue *Prosotas noreia* (Felder)
191. Dingy Lineblue *Petrelea dana* (De Nicéville)
192. Indian Sunbeam *Curetis thetis* (Drury)
193. Shiva's Sunbeam *Curetis siva* Evans
194. Toothed Sunbeam *Curetis dentata* Moore
195. Silverstreak Blue *Iraota timoleon* Stoll
196. Leaf Blue *Horsfieldia anita* Moore
197. Many-tailed Oak-Blue *Thaduka multicaudata* Moore
198. Large Oakblue *Arhopala amantes* (Hewitson)
199. Aberrant Bushblue *Arhopala abseus* (Hewitson)
200. Dark Broken-Band Oakblue *Arhopala atrax* (Hewitson)
201. Centaur Oakblue *Nilasera centaurus* (Fabricius)
202. Rosy Oakblue *Panchala alea* (Hewitson)
203. Tamil Oakblue *Narathura bazaloides* (Hewitson)
204. Common Acacia Blue *Surendra quercetorum* (Moore)
205. Silver Streaked Acacia Blue *Zinaspa todara* (Moore)
206. Yamfly *Loxura atymnus* (Cramer)
207. Common Silverline *Spindasis vulcanus* (Fabricius)
208. Long-banded Silverline *Spindasis lohita* (Horsfield)
209. Plumbeous Silverline *Aphnaeus schistacea* Moore
210. Abnormal Silverline *Aphnaeus abnormis* Moore
211. Common Shot Silverline *Aphnaeus ictis* Hewitson
212. Scarce Shot Silverline *Aphnaeus elima* Moore
213. Lilac Silverline *Aphnaeus lilacinus* Moore
214. Redspot *Zesius chrysomallus* Hübner
215. White Royal *Pratapa deva* (Moore)
216. Silver Royal *Ancema blanka* (De Nicéville)
217. Broadtail Royal *Creon cleobis* (Godart)
218. Plains Blue Royal *Tajuria jehana* Moore
219. Peacock Royal *Tajuria cippus* (Fabricius)
220. Spotted Royal *Tajuria maculata* Hewitson
221. Branded Royal *Ops melastigma* (De Nicéville)

222. Banded Royal *Charana jalindra* Moore
223. Common Imperial *Cheritra freja* (Fabricius)
224. Monkey Puzzle *Rathinda amor* (Fabricius)
225. Common Onyx *Horaga onyx* (Moore)
226. Brown Onyx *Horaga viola* Moore
227. Common Tinsel *Catapaecilma elegans* Druce
228. Orchid Tit *Chliaria othona* (Hewitson)
229. Nilgiri Tit *Chliaria nilgirica* (Moore
230. Fluffy Tit *Zeltus etolus* (Fabricius)
231. Cornelian *Deudorix epijarbas* (Moore)
232. Common Guava Blue *Virachola isocrates* (Fabricius)
233. Large Guava Blue *Virachola perse* (Hewitson)
234. Indigo Flash *Rapala varuna* (Hewitson)
235. Slate Flash *Rapala schistacea* (Moore)
236. Common Red Flash *Rapala iarbus* (Fabricius)
237. Malabar Flash *Vadebra lankana* (Moore)
238. Plane *Bindahara phocides* (Fabricius)

Family HESPERIIDAE

Coeliadinae

239. Brown Awl *Badamia exclamationis* (Fabricius)
240. Pale Green Awlet *Bibasis gomata* (Moore)
241. Orange-striped Awl/Orange Awlet *Bibasis jaina* (Moore)
242. Orangetail Awl/Pale Green Awlet *Bibasis sena* (Moore)
243. Indian Awlking, *Choaspes benjaminii* (Guérin-Meneville)
244. Common Awl *Hasora badra* (Moore)
245. Common Banded Awl *Hasora chromus* (Cramer)
246. White Banded Awl *Hasora taminatus* (Hübner)
247. Plain Banded Awl *Hasora vitta* (Butler)

HESPERIINAE

248. Dingy Scrub-Hopper *Aeromachus dubius* (Elwes & Edwards)
249. Pygmy Grass/Scrub-Hopper *Aeromachus pygmaeus* (Fabricius)
250. Bush Hopper *Ampittia dioscorides* (Fabricius)
251. Coorg Forest Hopper *Arnetta mercara* (Evans)
252. Vindhyan Bob *Arnetta vindhiana* (Moore)
253. Paintbrush Swift *Baoris farri* (Moore)
254. Hedge/Hampson's Hedge-Hopper *Baracus vittatus* (Felder)
255. Beavan's Swift *Pseudoborbo bevani* (Moore)
256. Rice Swift *Borbo cinnara* (Wallace)
257. Kanara Swift *Caltoris canaraica* (Moore)
258. Blank Swift *Caltoris kumara* (Moore)
259. Philippine Swift *Caltoris philippina* (Herrich-Schäffer)
260. Wax Dart *Cupitha purreea* (Moore)
261. Palm Redeye *Erionota thrax* (Linnaeus)
262. Giant Redeye *Gangara thyrsis* (Fabricius)
263. Indian/Ceylon Ace *Halpe homolea* (Hewitson)
264. Moore's Ace *Halpe porus* (Mabille)
265. Chestnut Bob *Iambrix salsala* (Moore)
266. Common Redeye *Matapa aria* (Moore)
267. Restricted Demon *Notocrypta curvifascia* (Felder & Felder)
268. Common Banded Demon *Notocrypta paralysos* (Wood-Mason & de Nicéville)
269. African Straight/Straight Swift *Parnara naso* (Fabricius)
270. Continental Swift *Parnara ganga* (Evans)
271. Dark Branded Swift *Pelopidas agna* (Moore)
272. Conjoined Swift *Pelopidas conjuncta* (Herrich-Schäffer)
273. Dark Small-Branded Swift *Pelopidas mathias* (Fabricius)
274. Large Branded Swift *Pelopidas subochracea* (Moore)
275. Contiguous Swift *Polytremis lubricans* (Herrich-Schäffer)
276. Confucian/Chinese Dart *Potanthus confucius* (Felder & Felder)
277. Pallied Dart *Potanthus pallida* (Evans)
278. Palni Dart *Potanthus palnia* (Evans)

279. Pava Dart *Potanthus pava* (Fruhstorfer)
280. Pseudomaesa/Common Dart *Potanthus pseudomaesa* (Moore)
281. Coon *Psolos fuligo* (Mabille)
282. Yellow-Base/Golden Tree Flitter *Quedara basiflava* (De Nicéville)
283. Maculate Lancer *Salanoemia sala* (Hewitson)
284. Bicolour Ace *Sovia hyrtacus* (De Nicéville)
285. Indian Palm Bob, *Suastus gremius* (fabricius)
286. Small Palm Bob, *Suastus minuta* (Moore)
287. Tamil Grass Dart *Taractrocera ceramas* (Hewitson)
288. Common Grass Dart *Taractrocera maevius* (Fabricius)
289. Dark Palm Dart *Telicota ancilla* (Herrich-Schäffer)
290. Pale Palm Dart *Telicota colon* (Fabricius)
291. Plain Palm Dart *Cephrenes chrysozona* (Plötz)
292. Southern Spotted Ace or Unbranded Ace *Thoressa astigmata* (Swinhoe)
293. Evershed's Ace *Thoressa evershedi* (Evans)
294. Madras Ace *Thoressa honorei* (De Nicéville)
295. Tamil Ace or Sitala Ace *Thoressa sitala* (De Nicéville)
296. Grass Demon, *Udaspes folus* (Cramer)
297. Tree Flitter *Hyarotis adrastus* (Stoll)
298. Brush Flitter *Hyarotis microstrictum* (Wood-Mason & de Nicéville)
299. Tamil Dartlet *Oriens concinna* (Elwes & Edwards)
300. Common Dartlet *Oriens goloides* (Moore)

PYRGINAE

301. Golden Angle *Caprona ransonnetti* (Felder)
302. Spotted Angle *Caprona agama* (Moore)
303. Spotted Angle *Caprona alida* (De Nicéville)
304. Malabar Spotted Flat *Celaenorrhinus ambareesa* (Moore)
305. Common Spotted Flat *Celaenorrhinus leucocera* (Kollar)
306. Tamil Spotted Flat *Celaenorrhinus ruficornis* (Mabille)
307. Tricolour Flat *Cogia indrani* (Moore)
308. Fulvous Pied Flat *Coladenia dan* (Fabricius)
309. Common Yellowbreasted Flat *Gerosis bhagava* (Moore)
310. African Mallow/Marbled Skipper, *Gomalia elma* (Trimen)
311. Chestnut/Banded Angle *Odontoptilum angulata* (Felder)
312. Common Small Flat *Sarangesa dasahara* (Moore)
313. Spotted Small Flat *Sarangesa purendra* (Moore)
314. Indian Grizzled/Indian Skipper *Spialia galba* (Fabricius)
315. Immaculate/Large/Suffused Snow Flat *Tagiades gana* (Moore)
316. Common/Ceylon Snow Flat *Tagiades jepetus* (Stoll)
317. Water Snow Flat *Tagiades litigiosa* (Möschler)
318. Angled Flat/Black Angle *Tapena twaithesi* (Moore)

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INSECTA : TRICHOPTERA

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INTRODUCTION

Small to moderate sized moth-like insects commonly called 'caddis-flies'. Their cruciform larvae popularly referred as 'caddis worms' are capable of constructing silky cases to live in. Adults bear setaceous antennae, densely hairy membranous wings with a very few cross veins and are kept roof-like over the back at rest. Forewings are elongate and hind-wings broader with folded anal area. Wings with very few crossveins.

World's extant valid species of Trichoptera are 12,627, accommodated in 46 extant families (Morse, 2009). In the light of world checklist (Morse, 2009), the caddisflies of Karnataka fauna is known by following 53 valid species belonging to 14 genera under 6 families.

1. *Diplectrona indica* (Mosely 1931)
   Distribution : Karnataka, Belgaum

Subfamily HYDROPSYCHINAE J. Curtis, 1835

2. *Cheumatopsyche marianne* Ola'h & Johanson, 2008
   Distribution : Karnataka
3. *Hydromanicus topali* Ola'h & Johanson, 2008
   Distribution : Karnataka

Subfamily MACRONEMATINAE G.Ulmer, 1905

Tribe **Macronematini** G. Ulmer, 1905

4. *Amphipsyche distincta* Martynov 1935)
   Distribution : Karnataka.

Family PSYCHOMYIIDAE F. Walker, 1852

Subfamily TINODINAE, Y. J. Li & J C Morse, 1997

5. *Tinodes pullulans* Navas 1932
   Distribution : Karnataka

Family XIPHOCENTRONIDAE H.H. Ross, 1949

Subfamily XIPHOCENTRONINAE H.H. Ross, 1949

6. *Abaria achwatirtha* Schmid 1982
   Distribution : Karnataka
7. *Melanotrichia pachupati* Schmid 1982
   Distribution : Karnataka
8. *Melanotrichia singularis* Ulmer 1906
   Distribution Karnataka

Superfamily LEPTOCEROIDEA W.E. Leach, 1815

Family MOLANNIDAE H.D.J. Wallengren, 1831

9. *Molanna paramoesta* Wiggins 1968
   Distribution : Karnataka

Family LEPTOCERIDAE W.E.Leach, 1815

Subfamily LEPTOCERINAE W.E. Leach, 1815

Tribe **Leptocerini** W.E. Leach, 1815

10. *Leptocerus atiraskrita* Schmid 1987
    Distribution : Karnataka
11. *Leptocerus chatadalaja* Schmid 1987
    Distribution : Karnataka
12. *Leptocerus kchapavarna* Schmid 1987
    Distribution : Karnataka

13. *Leptocerus posticus* (Banks 1911)
Distribution : Karnataka
14. *Leptocerus sakantaka* Schmid 1987
Distribution : Karnataka
15. *Leptocerus samchita* Schmid 1987
Distribution : Karnataka,
16. *Leptocerus sudhara* Schmid 1987
Distribution : Karnataka
17. *Leptocerus sukhabaddha* Schmid 1987
Distribution : Karnataka

Tribe **Oecetini** A.J. Silfvenius, 1905

18. *Oecetis angustipennis* (Martynov 1936)
Distribution Karnataka
19. *Oecetis dakchineswara* Schmid, 1995
Distribution : Karnataka, Mysore
20. *Oecetis ichtasurama* Schmid, 1995
Distribution : Karnataka, Mysore
21. *Oecetis mahadeva* (Banks 1913)
Distribution : Karnataka
22. *Oecetis rajasimha* Schmid, 1995
Distribution : Karnataka, Mysore
23. *Oecetis vrindawama* Schmid, 1995
Distribution : Karnataka, Mysore

Tribe **Setodini** J.C. Morse, 1981

24. *Setodes abhiramika* Schmid 1987
Distribution : Karnataka
25. *Setodes abhrayita* Schmid 1987
Distribution : Karnataka
26. *Setodes acchidra* Schmid 1987
Distribution : Karnataka
27. *Setodes akutila* Schmid 1987
Distribution : Karnataka
28. *Setodes asammuaddha* Schmid 1987
Distribution : Karnataka
29. *Setodes atiloma* Schmid 1987
Distribution : Karnataka
30. *Setodes atipunya* Schmid 1987
Distribution : Karnataka
31. *Setodes bhimachringa* Schmid 1987
Distribution : Karnataka
32. *Setodes dantavarna* Schmid 1987
Distribution : Karnataka
33. *Setodes ekachringa* Schmid 1987
Distribution : Karnataka
34. *Setodes himaruna* Schmid 1987
Distribution : Karnataka
35. *Setodes kalyana* Schmid 1987
Distribution : Karnataka
36. *Setodes kapchajalaja* Schmid 1987
Distribution : Karnataka
37. *Setodes lineatus* Banks 1913
Distribution : Karnataka
38. *Setodes madhuvarna* Schmid 1987
Distribution : Karnataka,
39. *Setodes meghavarna* Schmid 1987
Distribution : Karnataka
40. *Setodes monicae* Schmid 1987
Distribution : Karnataka
41. *Setodes nyuna* Schmid 1987
Distribution : Karnataka
42. *Setodes parisamchuddha* Schmid 1987
Distribution : Karnataka
43. *Setodes supattra* Schmid 1987
Distribution : Karnataka
44. *Setodes trikantayudha* Schmid
Distribution : Karnataka
45. *Setodes vitanka* Schmid 1987
Distribution : Karnataka
46. *Setodes vratachakora* Schmid 1987
Distribution : Karnataka
47. *Trichosetodes damchtragada* Schmid 1987
Distribution : Karnataka
48. *Trichosetodes karapatradhara* Schmid 1987
Distribution : Karnataka

Superfamily PHILOPOTAMOIDEA
J.F. Stephens, 1829

Family PHILOPOTAMIDAE J.F. Stephens, 1829

Subfamily PHILOPOTAMINAE
J.F. Stephens, 1829

49. *Gunungiella chovimchi* Schmid 1968
Distribution : Karnataka
50. *Gunungiella dvadachi* Schmid 1968
Distribution : Karnataka
51. *Gunungiella ekatrimchi* Schmid 1968
Distribution : Karnataka
52. *Gunungiella navavimchi* Schmid 1968
Distribution : Karnataka

Subfamily CHIMARRINAE P. Rambur, 1842

53. *Chimarra henryi* Kimmins 1957
Distribution : Karnataka

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Schmid, F. 1982.La Famille des Xiphocentronides (Trichoptera: Annulipalpia). *Mem. Soc. Ent., Canada*, **121** : 1-127.

Schmid, F. 1987. Considerations diverses sur quelques genres leptocerins. *Bull. Inst. R. Sci. nat. Belgique (Ent),* **57** (Supplement) : 1-147, 29 pl.

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Schmid, F. 1995c. Le genre *Oecetis* en Inde (Trichoptera : Leptoceridae). *Fabreries*, **20**(4) : 113-151.

Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 211-218, 2013

INSECTA : HYMENOPTERA : CHALCIDOIDEA : PTEROMALIDAE

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INTRODUCTION

The family Pteromalidae represents one of the largest and taxonomically difficult families of Chalcidoidea (Hymenoptera Parasitica), members of which are found all over the world and virtually in all habitats except Polar Regions. Majority of Pteromalidae are primary or secondary parasitoids attacking a large range of insect orders in their various stages of development and some arachnida, hence of economic importance in the biological control of noxious insect pests. A few species are phytophagous developing in seeds and make galls in plants. Many species of Pteromalidae have been employed successfully in biological control programmes all over the world.

The family contains over 3500 described species under 588 genera world wide (Noyes, 2003). When compared to the other parts of the world, the knowledge on the Pteromalid fauna of Indian subcontinent is still far from satisfactory. Boucek *et al.* (1979) provided a more complete picture of the Pteromalid fauna of Indian subcontinent which was supplemented by works of Farooqi & Subba Rao (1985, 1986), Sureshan (2003, 2007), and Sureshan & Narendran (2003, 2004). Currently 224 species of Pteromalidae under 101 genera and 17 subfamilies are reported from the Indian subcontinent, out of which Indian fauna is represented by 196 species under 91 genera and 16 subfamilies. When compared to the other parts of India, the southern states are more explored for the collection of Pteromalidae.

The present paper is an inventory of the species of Pteromalidae reported from the Indian state of Karnataka which is based on the information available in the literature. 55 species of Pteromalidae belonging to 32 genera and 10 subfamilies are known to occur in the state of Karnataka. The classification of Boucek (1988) is followed in the present work.

SYSTEMATIC ACCOUNT

Class INSECTA

Order HYMENOPTERA

Suborder APOCRITA (Parasitica)

Superfamily CHALCIDOIDEA

Family PTEROMALIDAE

Subfamily CLEONYMINAE

Genus ***Heydenia,*** Forster, 1856

1. ***Heydenia tuberculata*** Sureshan, 2000

2000. *Heydenia tuberculata* Sureshan, *Zoos'print Journal*, **15**(2) : 197.

Distribution : India : Karnataka (Coorg)

2. ***Heydenia indica*** Narendran *et al.,* 2001

2001. *Heydenia indica* Narendran *et al. Entomon.*, **26**(2) : 150.

2008. *Heydenia indica* Narendran *et al.,* Narendran *et al., J. Biol. Control.*, **22**(2) : 252.

Distribution : India : Karnataka (Bangalore), Jammu & Kashmir.

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Genus ***Grooca*** Sureshan & Narendran, 1997

3. ***Grooca coorgensis*** (Sureshan & Narendran, 1995)

1995. *Neoepistenia coorgensis* Sureshan & Narendran. *J. Bombay nat. Hist. Soc.*, **92** : 97.

1997. *Grooca coorgensis* (Sureshan & Narendran) : Sureshan & Narendran, *J. Bombay nat. Hist. Soc.*, **94**(1) : 175.

Distribution : India : Karnataka (Coorg).

Elsewhere : Malaysia, Thailand.

Subfamily ORMOCERINAE

Genus ***Systasis*** Walker, 1834

4. ***Systasis dalbergiae*** Mani, 1942

1942. *Systasis dalbergiae* Mani. *Indian. J. Ent.*, **4** : 157-158.

2007. *Systasis dalbergiae* Mani : Sureshan, *Rec. zool. Surv. India. Occ. Paper*, **268** : 38.

Distribution : India : Karnataka (Bangalore), Uttaranchal, Uttar Pradesh, Delhi.

Subfamily ASAPHINAE

Genus ***Asaphes*** Walker, 1834

5. ***Asaphes vulgaris*** Walker, 1834

1834. *Asaphes vulgaris* Walker : *Ent. Mag.*, **2** : 152.

2008. *Asaphes vulgaris* Walker : Ankita Gupta & Poornai. *Biosystematica,* **1**(2) : 22.

Distribution : India : Karnataka (Hebbal), Meghalaya, Uttar Pradesh.

Elsewhere : Nepal, Pakistan.

Subfamily DIPARINAE

Genus ***Dipara*** Walker, 1833

6. ***Dipara sringericus*** (Narendran, 2006)

2006. *Parurios sringericus* Narendran in Narendran *et al. J. Bio. Sci. Raj.*, **14** : 17, 20-21. Syn. Desjardins. 2007. 1647 : 42, 46.

Di*stribution* : India : Karnataka (Sringeri).

Subfamily CEROCEPHALINAE

Genus ***Cerocephala*** Westwood, 1832

7. ***Cerocephala dinoderi*** Gahan, 1925

1925. *Cerocephala dinoderi* Gahan. *Philippine J. Sci.*, **27** : 100-102.

2003. *Cerocephala dinoderi* Gahan : Sureshan & Narendran. *Zoos'print journal*, **18**(5) : 1104.

Distribution : India : Karnataka (Mysore) Arunachal Pradesh, West Bengal.

Elsewhere : Sri Lanka, Philippines, Thailand, Hawaii, Indonesia, Australia, America.

Genus ***Theocolax*** Westwood, 1832

8. ***Theocolax elegans*** (Westwood, 1874)

1874. *Choetospila elegans* Westwood. *Thesaurus Ent. Oxon.* 137. Syn. Boucek,1988 : 339.

2003. *Theocolax elegans* (Westwood). Sureshan & Narendran. *Zoos' print journal*, **18**(5) : 1104.

Distribution : India : Karnataka (Dharwar), Kerala, Arunachal Pradesh, Tamil Nadu, Delhi.

Elsewhere : Pakistan, China, Australia, S. Africa, America., Palearctic Region.

Subfamily SPALANGINAE

Genus ***Spalangia*** Latreille, 1805

9. ***Spalangia cameroni*** Perkins, 1910

1910. *Spalangia cameroni* Perkins. *Fauna Hawaii*, **2**(6) : 656.

2003. *Spalangia cameroni* Perkins. : Sureshan & Narendran. *Zoos'print journal*, **18**(5) : 1104.

Distribution : India : Karnataka (Bangalore), Delhi, Pondicherry.

Elsewhere : Cosmopolitan

10. ***Spalangia fuscipes*** Nees, 1834

1834. *Spalangia fuscipes* Nees, *Hym. Ichneum. Affin. Monogr.*, **2** : 270.

2007. *Spalangia fuscipes* Nees : Sureshan. *Rec. zool. Surv. India, Occ. Paper*, **268** : 34.

Distribution : India : Karnataka (Bangalore), Andhra Pradesh.

Elsewhere : Palearctic, Nearctic and Oriental region.

11. ***Spalangia gemina*** Boucek, 1963

1963. *Spalangia gemina* Boucek. *Acta Ent. Mus. nat. Pragae.*, **35** : 484.

2003. *Spalangia gemina* Boucek. Sureshan & Narendran. *Zoos'print journal,* **18**(5) : 1104.

Distribution : India : Karnataka, W. Bengal, Tamil Nadu.

Elsewhere : Brazil, Fiji, Malaysia, China, Thailand.

12. ***Spalangia nigra*** Latreille, 1805

1805. *Spalangia nigra* Latreille. *Hist.nat. Crust. Ins.*, **13** : 228.

2008. *Spalangia nigra* Latreille. Ankita Gupta & Poornai. *Biosystematica*, **1**(2) : 23.

Distribution : India : Karnataka (Bangalore); Germany, America.

13. ***Spalangia nigroaenea*** Curtis, 1839

1839. *Spalangia nigroaenea* Curtis, *Brit. Ent.*, **16** : fol. 740. P(2).

2007. *Spalangia nigroaenea* Curtis : Sureshan. *Rec. zool. Surv. India, Occ. Paper*, **268** : 34.

Distribution : India : Delhi, Karnataka (Bangalore), Maharashtra, Pondicherry.

Elsewhere : Sri Lanka, Bangladesh, Pakistan; cosmopolitan.

14. ***Spalangia obscura*** Boucek, 1963

1963. *Spalangia obscura* Boucek. *Acta Ent. Mus. nat. Pragae.*, **35** : 488

2003. *Spalangia obscura* Boucek : Sureshan & Narendran. *Zoos' print journal,* **18**(5) : 1104.

Distribution : India : Karnataka (Kamalashile).

Elsewhere : Malaysia, China, Philippines.

Subfamily HERBERTINAE

Genus ***Herbertia*** Howard, 1894

15. ***Herbertia indica*** Burks, 1959

1959. *Herbertia indica* Burks, *Proc. Ent. Soc. Wash.*, **61**(6) : 252.

2007. *Herbertia indica* Burks : Sureshan. *Rec. zool. Surv. India, Occ. Paper*, **268** : 11.

Distribution : India : Karnataka (Bangalore), Madhya Pradesh, Bihar, Maharashtra, Kerala.

Elsewhere : Sri Lanka, China, Malaysia.

Subfamily EUNOTINAE

Genus ***Cephaleta*** Motschulsky, 1859

16. ***Cephaleta brunniventris*** Motschulsky, 1859

1859. *Cephaleta brunniventris* Motschulsky. *Etudes Ent.* **8** : 174.

2003. *Cephaleta brunniventris* Motschulsky : Sureshan & Narendran. *Zoos' print journal*, **18**(5) : 1105

Distribution : India : Karnataka (Bangalore), Assam, Manipur, Tamil Nadu, Bihar, Uttar Pradesh, West Bengal, Pondicherry, Goa, Kerala, Daman & Diu, Andaman & Nicobar Islands, Andhra Pradesh, Delhi.

Elsewhere : Bangladesh, Pakistan, Sri Lanka, China, Philippines, Taiwan, Nearctic region.

Genus ***Moranila*** Cameron, 1881

17. ***Moranila californica*** (Howard, 1881)

1881. *Tomocera californica* Howard. *Rept. U.S. Dept. Agr. Ent. for 1880* : 368. Syn. Burks, 1958 : 75.

2003. *Moranila californica* (Howard) : Sureshan & Narendran. *Zoos'print journal*, **18**(5) : 1105

Distribution : India : Karnataka (Bangalore).

Elsewhere : Australian, Palearctic and Nearctic regions.

Genus ***Scutellista*** Motschulsky, 1859

18. ***Scutellista caerulea*** (Fonscolombe, 1832)

1832. *Encyrtus caeruleus* Fonscolombe. *Annls. Sci. nat. (Zool.)* (I) **26** : 304. Syn. Graham. 1969 : 76.

2003. *Scutellista caerulea* (Fonscolombe, 1832) : Hayat *et al. Oriental Ins.*, **37** : 326.

Distribution : India : Karnataka (Bangalore), Gujrat, Maharashtra.

Elsewhere : Sri Lanka, Afrotropical, Nearctic and Oriental regions.

Subfamily PTEROMALINAE

Genus ***Acroclisoides*** Girault & Dodd, 1915

19. ***Acroclisoides maculatus*** Sureshan & Narendran, 2002

2002. *Acroclisoides maculatus* Sureshan & Narendran. *Rec. zool. Surv. India*, **100**(3-4) : 128.

2009. *Acroclisoides maculatus* Sureshan & Narendran : Ankita Gupta & Poornai. *J. Threatened taxa* **1**(5) : 300.

Distribution : India : Karnataka (Bangalore), Kerala, Tamil Nadu. Maharashtra,

Genus ***Agiommatus*** Crawford, 1911

20. ***Agiommatus geethae*** Sureshan & Narendran, 1996

1996. *Agiommatus geethae* Sureshan & Narendran. *J. Bombay nat. HIst. Soc.*, **93** : 59-61.

Distribution : India : Karnataka (Bangalore)

Genus ***Anisopteromalus*** Ruschka, 1912

21. ***Anisopteromalus calandrae*** (Howard, 1881)

1881. *Pteromalus calandrae* Howard. *Ann.Report U.S. Dept. Agr. For.,* 1880 : 273. Syn. Peck, 1951 : 564.

2003. *Anisopteromalus calandrae* (Howard) : Sureshan. *Rec. zool. Surv. India, Occ. Paper.* **205** : 16.

Distribution : India : Karnataka, Kerala, Tamil Nadu, Himachal Pradesh, Rajasthan, West Bengal.

Elsewhere : Cosmopolitan.

Genus ***Cyrtophagoides*** Narendran, 2008

22. ***Cyrtophagoides ghoonbori*** Narendran, 2008

2008. *Cyrtophagoides ghoonbori* Narendran. in Narendran *et al. J. Biol. Control.*, 22(2) : 250.

Distribution : India : Karnataka (Bangalore)

Genus ***Dinarmus*** Thomson, 1878

23. ***Dinarmus acutus*** (Thomson, 1878)

1847. *Pteromalus robustus* Walker.230. Syn. Graham, 1969 (nec. Walker, 1835)

1878. *Dinarmus (Dinarmus) acutus* Thomson. *Hym. Scand.* **5** : 56.

2007. *Dinarmus acutus* (Thomson) : Sureshan. *Rec. zool. Surv. India. Occ. Paper.* **268** : 8.

Distribution : India : Karnataka (Bangalore), Kerala.

Elsewhere : Sri Lanka, Europe.

24. ***Dinarmus basalis*** (Rondani, 1877)

1877. *Entedon basalis* Rondani. *Boll. Soc. Ent. Ital.*, **9** : 174. Syn. Boucek, 1974. 245-246.

2001. *Dinarmus basalis* (Rondani) : Sureshan & Narendran. *Zoos'print. Journal,* **18**(5) : 1106.

Distribution : India : Karnataka (Bangalore) Kerala, Bihar, Delhi, Tamil Nadu.

Elsewhere : Bangladesh

25. ***Dinarmus colemani*** (Crawford, 1913)

1913. *Bruchobius colemani* Crawford. *Proc. U.S. Natn. Mus.* **45** : 250.

2001. *Dinarmus colemani* (Crawford) : Sureshan & Narendran. *Zoos' print. Journal,* **18**(5) : 1106.

Distribution : India : Karnataka (Bangalore), Kerala, Tamil Nadu, Delhi, Jharkhand, Bihar.

Elsewhere : Bangladesh.

26. ***Dinarmus crotalariae*** Ankita Gupta, 2007

2007. *Dinarmus crotalariae* Ankita Gupta. *Entomon.*, **32**(3) : 162.

Distribution : India : Karnataka (Bangalore).

27. ***Dinarmus maculatus*** (Masi, 1924)

1924. *Sphaerakis maculatus* Masi. *Ann. Mus. Civ. Stor. Nat. Giacomo Doria*, **51** : 157. Syn. Boucek *et al.,* 1979 : 442.

2008. *Dinarmus maculatus* (Masi) : Ankita Gupta & Poornai. *Biosystematica*, **1**(2) : 22.

Distribution : India : Karnataka (Bangalore), Kerala, Tamil Nadu, West Bengal.

Elsewhere : Myanmar.

28. ***Dinarmus vagabundus*** (Timberlake, 1926)

1926. *Bruchobius vagabundus* Timberlake. *Proc. Hawaii Ent. Soc.*, **6** : 305. Syn. Boucek *et al.,* 1979 : 442.

2001. *Dinarmus vagabundus* (Timberlake) : Sureshan & Narendran. *Zoos'print. Journal,* **18**(5) : 1106.

Distribution : India : Karnataka, Punjab, Tamil Nadu, Kerala.

Elsewhere : Pakistan, Sri Lanka

Genus *Inkaka* Girault, 1939

29. ***Inkaka keralensis*** Sureshan & Narendran, 1997

1997. *Inkaka keralensis* Sureshan & Narendran. *Hexapoda*, **9**(1&2) : 30.

2007. *Inkaka keralensis* Sureshan & Narendran : Sureshan. *Rec. zool. Surv. India. Occ. Paper*, **268** : 13.

Distribution : India : Karnataka (Bangalore), Kerala.

Genus ***Euneura*** Walker, 1844

30. ***Euneura lachni*** (Ashmead, 1887)

1887. *Pachycrepis lachni* Ashmead : *Trans. Amer. Ent. Soc.*, **14** : 193.

2008. *Euneura lachni* (Ashmead) : Ankita Gupta & Poornai. *Biosystematica*, **1**(2) : 22.

Distribution : Karnataka (Chikahallapura).

Elsewhere : Pakistan, Europe and America.

Genus ***Kumarella*** Sureshan, 1999

31. ***Kumarella angulus*** Sureshan, 1999

1999. *Kumarella angulus* Sureshan. *Oriental Insects*, **32** : 100-101.

2004. *Kumarella angulus* Sureshan : Sureshan. *Rec. zool. Surv. India*, **103**(3-4) : 125-127.

Distribution : (India : Karnataka (Biligiri Rangaswamy Temple Wild life sanctuary), Kerala, Maharashtra)

Genus ***Metastenus*** Walker, 1834

32. ***Metastenus concinnus*** Walker, 1834

1834. *Metastenus concinnus* Walker. *Ent. Mag.*, **2** : 302.

2007. *Metastenus concinnus* Walker : Sureshan. *Rec. zool. Surv. India. Occ. Paper*, **268** : 18.

Distribution : India : Karnataka (Bangalore), Kerala.

Elsewhere : Europe.

Genus ***Mokrzeckia*** Mokrzecki, 1933

33. ***Mokrzekia menzeli*** Subba Rao, 1973

1973. *Mokrzeckia menzeli* Subba Rao. *Proc. Ind. Acad. Sci.(Anim. Sci.)* **90** : 479.

2007. *Mokrzeckia menzeli* Subba Rao : Sureshan. *Rec. zool. Surv. India. Occ. Paper*. **268** : 18.

Distribution : India : Karnataka (Bangalore), Kerala, Uttaranchal, Uttar Pradesh.

34. ***Mokrzeckia orientalis*** Subba Rao, 1973

1973. *Mokrzeckia orientalis* Subba Rao. *Oriental Ins.* 7 : 356.

2003. *Mokrzeckia orientalis* Subba Rao. Sureshan & Narendran. *Zoos' print Journal,* **18**(15) : 1107.

Distribution : India : Karnataka, Maharashtra, Uttar Pradesh, Meghalaya.

Elsewhere : Sri Lanka, Indonesia, Thailand

Genus ***Norbanus*** Walker, 1843

35. ***Norbanus acuminatus*** Dutt & Ferriere, 1961

1961. *Norbanus acuminatus* Dutt & Ferriere. *Ind. J. Agric. Sci.*, **31** : 141.

2007. *Norbanus acuminatus* Dutt & Ferriere : Sureshan. *Rec. zool. Surv. India. Occ. Paper*, **268** : 20.

Distribution : India : Karnataka (Bangalore) West Bengal, Kerala.

36. ***Norbanus equs*** Sureshan, 2003

2003. *Norbanus equs* Sureshan. *Rec. zool. Surv. India. Occ. Paper*, **205** : 61.

2007. *Norbanus equs* Sureshan. Sureshan. *Rec. zool. Surv. India. Occ. Paper*, **268** : 24.

Distribution : India : Karnataka (Bangalore), Kerala,

37. ***Norbanus malabarensis*** Sureshan, 2003

2003. *Norbanus malabarensis* Sureshan. *Rec. zool. Surv. India. Occ. Paper*, **205** : 62.

2007. *Norbanus malabarensis* Sureshan. Sureshan. *Rec. zool. Surv. India. Occ. Paper*, **268** : 24.

Distribution : India : Karnataka (Bangalore), Kerala.

38. ***Norbanus thekkadiensis*** Sureshan, 2003

2003. *Norbanus thekkadiensis* Sureshan. *Rec. zool. Surv. India. Occ. Paper*, **205** : 60.

2007. *Norbanus thekkadiensis* Sureshan. Sureshan. *Rec. zool. Surv. India. Occ. Paper*, **268** : 24.

Distribution : India : Karnataka (Bangalore), Kerala.

Genus ***Oricoruna*** Boucek, 1978

39. ***Oricoruna arcotensis*** (Mani & Kurian, 1953)

1953. *Pachycrepoideus arcotensis* Mani & Kurian. *Ind. J. Ent.* **15** : 11. syn. Boucek *et al.*, **1979** : 449.

2007. *Oricoruna arcotensis* (Mani & Kurian) : Sureshan. *Rec. zool. Surv. India. Occ. Paper*, **268** : 26.

Distribution : India : Karnataka (Bangalore), Jharkhand, Bihar, Tamil Nadu.

Genus ***Pachycrepoideus*** Ashmead, 1904

40. ***Pachycrepoideus veerannai*** Narendran & Anil, 1992

1992. *Pachycrepoideus veerannai* Narendran & Anil. *Bioved,* **3**(1) : 1-3.

Distribution : India : Karnataka (Bangalore).

41. ***Pachycrepoideus vindemmiae*** (Rondani, 1875)

1875. *Encyrtus (Pteromalus) vindemmiae* Rondani. *Boll. Comizio Agrar. Parmen,* **8** : 148.

2003. *Pachycrepoideus vindemmiae* (Rondani) : Sureshan. *Rec. zool. Surv. India. Occ. Paper*, **205** : 69.

Distribution : India : Karnataka (Bangalore), Chandigarh, Haryana, Pondicherry, Punjab, Uttar Pradesh, Maharashtra, Tamil Nadu.

Genus ***Pachyneuron*** Walker, 1833

42. ***Pachyneuron aeneum*** Masi, 1929

1929. *Pachyneuron aeneum* Masi, *Ann. Mus. Civ. Stor. Nat. Giacomo Doria.*, **53** : 229.

2007. *Pachyneuron aeneum* Masi. Sureshan. *Rec. zool. Surv. India, Occ. Paper*, **268** : 28

Distribution : India : Karnataka (Bangalore), Delhi, Uttar Pradesh.

43. ***Pachyneuron ahlaense*** Mani & Saraswat, 1974

1974. *Pachyneuron ahlaensis* Mani & Saraswat. *Mem. School. Ent. Agr. No.* **3**. 90.

Distribution : India : Karnataka (Bangalore), Delhi, Haryana, Himachal Pradesh

44. ***Pachyneuron aphidis*** (Bouche, 1834)

1834. *Diplolepis aphidis* Bouche. *Natur. Ins. Berlin.* **5** : 17.

2003. *Pachyneuron aphidis* (Bouche) : Sureshan. *Rec. zool. Surv. India. Occ. Paper,* **205** : 72.

Distribution : India : Karnataka, Jammu& Kashmir, Delhi, Haryana, Himachal Pradesh, Punjab.

Elsewhere : Pakistan

45. ***Pachyneuron bangalorensis*** Sureshan, 2007

2007. *Pachyneuron bangalorensis*, Sureshan. *Rec. zool. Surv. India. Occ. Paper*, **268** : 28

Distribution : India : Karnataka (Bangalore).

46. ***Pachyneuron groenlandicum*** (Holmgren, 1872)

1872. *Pteromalus groenlandicus* Holmgren. *Ofvers. Kungl. Vet. Akad. Forh.*, **29** : 100.

2003. *Pachyneuron groenlandicum* (Holmgren) : Sureshan. *Rec. zool. Surv. India. Occ. Paper,* **205** : 72.

Distribution : India : Karnataka (Bangalore), Kashmir, Delhi, Orissa, Kerala, Tamil Nadu, Himachal Pradesh, Haryana.

47. ***Pachyneuron leucopiscida*** Mani, 1939

1939. *Pachyneuron leucopiscida* Mani. *Ind. J. Ent.*, **1** : 86.

2009. *Pachyneuron leucopiscida* Mani : Ankita Gupta & Poornai. *J. Threatened taxa,* **1**(5) : 301.

Distribution : India : Karnataka (Hebbal), Tamil Nadu, Bihar, Delhi,

48. ***Pachyneuron solitarium*** (Hartig, 1838)

1838. *Chrysolampus solitarius* Hartig. *Jahr. Forst. Naturk.*, **1** : 250.

2007. *Pachyneuron solitarium (*Hartig) : Sureshan. *Rec. Zool. Surv. India. Occ. Paper*, **268** : 29

Distribution : India : Karnataka (Bangalore), Kerala,

Genus ***Paracarotomus*** Ashmead, 1894

49. ***Paracarotomus cephalotes*** Ashmead, 1894

1894. *Paracarotomus cephalotes* Ashmead. *Trans. Amer. Ent. Soc.* **21** : 336.

2007. *Paracarotomus cephalotes (*Ashmead), Sureshan. *Rec. zool. Surv. India. Occ. Paper*, **268** : 31.

Distribution : India : Karnataka (Bangalore).

Elsewhere : Sri Lanka

Genus ***Propicroscytus*** Szelenyi, 1941

50. ***Propicroscytus oryzae*** (Subba Rao, 1973)

1973. *Obtusiclava oryzae* Subba Rao. *Bull. Ent. Res.* **62** : 627. Syn. Boucek *et al.*, **1979** : 453.

2007. *Propicroscytus oryzae* (Subba Rao) Sureshan. *Rec. zool. Surv. India. Occ. Paper*, **268** : 33.

Distribution : India : Karnataka (Bangalore), Kerala.

Elsewhere : Sri Lanka.

Genus ***Psilocera*** Walker, 1833

51. ***Psilocera heydoni*** Sureshan, 2001

2001. *Psilocera heydoni* Sureshan. *Oriental Ins.*, **35** : 87.

Distribution : India : Karnataka (Coorg).

Genus ***Sphegigaster*** Spinola, 1811

52. ***Sphegigaster karnatakaensis***, Sureshan, 2007

2007. *Sphegigaster karnatakaensis*, Sureshan. *Rec. Zool. Surv. India, Occ. Paper*, **268** : 36.

Distribution : India : Karnataka (Bangalore).

53. ***Sphegigaster stepicola*** Boucek, 1965

1965. *Sphegigaster stepicola* Boucek. *Acta Fauna Ent. Mus. Natl. Pragae* **11** : 12-14. Syn.Boucek *et al.*, 1979 : 458.

2007. *Sphegigaster stepicola* Boucek : Sureshan. *Rec. zool. Surv. India. Occ. Paper*, **205** : 90.

Distribution : India : Karnataka (Bangalore), Kerala, Delhi, Bihar, Uttar Pradesh.

Elsewhere : China, Europe, Africa.

Genus ***Trichomalopsis*** Crawford, 1913

54. ***Trichomalopsis apanteloctena*** (Crawford, 1911)

1911. *Trichomalopsis apanteloctenus* Crawford, 1911. *Proc. U.S. Natn. Mus.* **39** : 618.

2007. *Trichomalopsis apanteloctena* Crawford Sureshan. *Rec. zool. Surv. India, Occ. Paper,* **205** : 97.

Distribution : India : Karnataka (Mandya), Kerala, Andhra Pradesh, Meghalaya, Orissa, Uttar Pradesh, Tamil Nadu.

Elsewhere : Bangladesh

Subfamily PIRENINAE

Genus ***Gastrancistrus*** Westwood, 1833

55. ***Gastrancistrus cherryi*** Boucek, 1986

1986. *Gastrancistrus cherryi* Boucek. *Bull. Ent. Res.*, **76**(3) : 399.

Distribution : India : Karnataka, West Bengal.

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Boucek, Z. Subba Rao, B.R. & Farooqi, S.I. 1979. A preliminary review of Pteromalidae (Hymenoptera) of India and adjacent countries. *Oriental Insects*, **12**(4) : 433-467.

Farooqi, S.I. & Subba Rao, B.R. 1985. Family : Pteromalidae pp. 254-263. In Subba Rao & Hayat (Eds.). The Chalcidoidea (Insecta : Hymenoptera) of India and the adjacent countries Part. I. Review of families and keys to families and genera. *Oriental Ins.*, **19** : 161-310 & 15pp.

Farooqi, S.I. & Subba Rao, B.R. 1986. Family : Pteromalidae pp. 279-306. In Subba Rao & Hayat (Eds.). The Chalcidoidea (Insecta : Hymenoptera) of India and the adjacent countries Part. II. A catalogue. *Oriental Ins.*, **20** : 1-430.

Noyes, J. S. 2003. Universal Chalcidoidea database. www.nhm.ac.uk/jdsml/research-curation/projects/chalcidoids. Entomology/chalcidoids. (Last updated June 2012)

Sureshan, P.M. 2003. Pteromalinae (Pteromalidae : Chalcidoidea : Hymenoptera) of Indian subcontinent. *Rec.Zoool.surv. India. Occ. Paper* No., **205** : 1-170.

Sureshan, P.M. 2007. Taxonomic studies on Pteromalidae (Hymenoptera : Chalcidoidea) of Southeast Asia based on collections of Bohart Museum of Entomology, University of California, Davis, USA. *Rec. zool. Surv. India. Occ. Paper*, **268** : 1-42.

Sureshan, P.M. & Narendran, T.C. 2003. A checklist of Pteromalidae (Hymenoptera : Chalcidoidea) from the Indian subcontinent. *Zoos'print journal*, **18**(5) : 1099-1110

Sureshan, P.M. & Narendran, T.C. 2004. Key to the genera of Pteromalidae of India and the adjacent countries (Hymenoptera : Chalcidoidea). *Rec. zool. surv. India. Occ. Paper* No., **229** : 1-56.

Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 219-224, 2013

INSECTA : HYMENOPTERA : PLATYGASTROIDEA

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INTRODUCTION

Superfamily Platygastroidea is the third largest among the parasitic super families of Hymenoptera, after Chalcidoidea and Ichneumonoidea. The group is of great significance in applied entomology. A vast majority of its members are egg parasitoids, attacking the eggs of a wide range of insects which are of relevance either in the field of agriculture or forestry. Some of them also attack the eggs of spiders and the first instar larvae of gall midges as well.

Earlier, the super family Platygastroidea was composed of two families viz., Scelionidae and Platygastridae (Johnson 1992). But as of today, only Playgastridae remains valid, since Scelionidae was synonymised under Platygastridae by Sharkey et al.(2007), based on the results of a phylogenetic study by Murphy *et al.* (2007). While about 4500 species of Platygastroidea have been reported globally (Austin *et al.*, 2005), nearly 300 species have been known from India (unpublished data). The figures may not represent the magnitude of their true species diversity, since much of the fauna in the tropics including India are yet to be explored. Mani & Sharma (1982), Rajmohana (2006a, 2006b & 2007) and Ushakumari & Narendran (2007), document the known species from India.

The present paper is an inventory of the species under Platygastriodea, hitherto reported from Karnataka, based on the information available in literature as of 2010. 57 species of Platygastroidea belonging to 19 genera and 4 subfamilies are known to occur in the state of Karnataka.

SYSTEMATIC ACCOUNT

Class INSECTA

Order HYMENOPTERA

Suborder APOCRITA (Parasitica)

Superfamily PLATYGASTROIDEA

Family PLATYGASTRIDAE

Subfamily TELENOMINAE

Genus ***Mudigere*** Johnson, 1988

1. ***Mudigere bidentatus*** Johnson, 1988

1988. *Mudigere bidentatus* Johnson, *Colemania.* **5** : 25-28

Distribution in India : Karnataka (Mudigere)

Genus ***Paratelenomus*** Dodd, 1914

2. ***Paratelenomus saccharalis*** (Dodd) 1914

1914. *Telenomus saccharalis* (Dodd), *Can. Entomol.* **46** : 293

2007. *Paratelenomus saccharalis* (Dodd): Johnson, N.F. and L. Masner. 1985. *Syst. Entomol.*, **10** : 33-58

Distribution in India : Karnataka (Bangalore, Mysore); Kerala (Malappuram: Calicut University campus, Idukki: Periyar WLS, Palghat: Walayar); Tamilnadu (Valparai, Anaimalai Hills, Ootacamund).

Genus ***Psix*** Kozlov and Le, 1976

3. ***Psix abnormis*** Kozlov and Le, 1976

1976. *Psix abnormis* Kozlov and Le, *Zool. Zh.*, **55**:143-145.

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1985. *Psix abnormis* Kozlov and Le Johnson : N. F. and L. Masner. 1985. *Syst. Entomol.*, **10** : 33-58

Distribution in India : Karnataka (Bangalore); Uttar Pradesh (Aligarh); Tamilnadu : (Coimbatore).

4. ***Psix saccharicola*** (Mani, 1941)

1941. *Telenomus saccharicola* Mani, *Indian J. Entomol.* **3** : 26

1985. *Psix saccharicola* (Mani) Johnson, N.F. and L. Masner, *Syst. Entomol.*, **10** : 33-58

Distribution in India : Karnataka (Bangalore), New Delhi; Tamilnadu (Coimbatore, Marudumalai, Mudumalai)

5. ***Psix striaticeps*** (Dodd, 1920)

1920. *Telenomus striaticeps* (Dodd), *Trans Entomol Soc Lond.* : 355

1985. *Psix striaticeps* (Dodd), Johnson, N.F. and L. Masner. *Syst. Entomol.*, **10** : 50

Distribution in India : Karnataka (Hogenakal); New Delhi; Tamilnadu (Coimbatore)

Genus ***Telenomus*** Haliday, 1833

6. ***Telenomus beneficiens*** (Zehntner, 1896)

1896. *Ceraphron beneficiens* (Zehntner) *Arch. Java-Suikerindust.*, **4** : 487

1997. *Telenomus beneficiens* (Zehntner), in Narasimham *et al.* : *Tech. Bulletin*, PDBC, 17.

Distribution in India : Karnataka (Mandya); Orissa (Bhubaneshwar); Tamilnadu (Cuddalore)

Host : Ex. eggs of *Chilo infuscatellus*, *Chilo sacchariphagus*, *Scirpophaga nivella* on sugarcane (Narasimham *et al.*, 1997)

7. ***Telenomus dignus*** (Gahan), 1925

1925. *Phanurus dignus* Gahan, *Philippine J. Sci.*, **27** : 108.

1997. *Telenomus dignus* (Gahan), Narasimham *et al.* : *Tech. Bulletin*, PDBC, 17.

Distribution in India : Karnataka (Mandya); Orissa (Cuttack); Gujarat (Surat).

Host : Ex. eggs of *Scirpophaga nivella* on sugarcane, *Scirpophaga incertulas*

8. ***Telenomus remus*** Nixon, 1937

1937. *Telenomus remus* Nixon, *Ann. Mag. nat. Hist.* (10)**20** : 471

1997. *Telenomus remus* Nixon : in Narasimham *et al.* : *Tech. Bulletin*, PDBC, 17.

Distribution in India : Karnataka (Bangalore)

Host : Ex. eggs of *Spodoptera litura* (Narasimham *et al.*, 1997)

9. ***Telenomus rowani*** (Gahan, 1925)

1925. *Phanurus rowani* Gahan, *Philippine J. Sci.* **27** : 106

1997. *Telenomus rowani* Nixon : in Narasimham *et al.* : *Tech. Bulletin*, PDBC, 17 : 3

Distribution in India : Karnataka (Bangalore), Orissa (Sambalpur), Andhra Pradesh (Eluru).

Host : Ex. eggs of *Scirpophaga nivella* on paddy and *S. incertulas* on Sugarcane (Narasimham *etal*, 1997)

10. ***Telenomus sechellensis*** Kieffer, 1910

1910. *Telenomus sechellensis* Kieffer, 1910 : *Bull. Soc. Entomol. Fr.*, : 294.

1982. *Trissolcus seychellensis* (Kieffer), in Mani & Sharma. *Oriental Ins.*, **16** : 144.

Distribution in India : Karnataka (Mysore), Tamilnadu (Coimbatore)]

*Host*s : Ex Eggs of *Antestiopsis cruciata* on Jasmine (Mani & Sharma, 1982); Ex Eggs of *Cantheconidea furcellata* in South distribution (Mani & Sharma, 1982)

11. ***Telenomus talaus*** Nixon, 1937

1937. *Telenomus (Aholcus) talaus* Nixon, *Ann. Mag. nat. Hist.*, (10)**20** : 127

Distribution in India : Karnataka (Bangalore) (Examined in the collections at Project Directorate of Biological Control, Bangalore, Karnataka)

Subfamily TELEASINAE

Genus ***Trimorus*** Förster, 1856

12. ***Trimorus abbicolus*** Mukerjee, 1981

1981. *Trimorus abbicolus* Mukerjee, *Rec. zool. Surv. India Misc. Publ. Occ. Pap.* No., **2** : 1.

Distribution in India : Karnataka (Abbi Falls)

14. ***Trimorus appangalus*** Mukerjee, 1981

1981. *Trimorus appangalus* Mukerjee, *Rec. zool. Surv. India, Occ. Pap. No.,* **2** : 7.

Distribution in India : Karnataka (Appangala)

15. ***Trimorus atturensis*** Mukerjee, 1981

1981. *Trimorus atturensis* Mukerjee, *Rec. zool. Surv. India. Occ. Pap. No.,* **2** : 8

Distribution in India : Karnataka (Attur)

16. ***Trimorus dubarensis*** Mukerjee, 1981

1981. *Trimorus dubarensis* Mukerjee, *Rec. zool. Surv. India Misc. Publ. Occ. Pap.* No., **2** : 14.

Distribution in India : Karnataka (Dubare)

17. ***Trimorus dimidicornis*** Mukerjee, 1981

1981. *Trimorus dimidicornis* Mukerjee, *Rec. zool. Surv. India, Occ. Pap. No.,* **2** : 12

2007. *Trimorus dimidicornis* Mukerjee. *Fauna of Kudremukh National Park, Conservation Area Series,* **32** : 67.

Distribution in India : Karnataka (Kudremukh Wildlife Sanctuary : Hanumangundi).

18. ***Trimorus fasciatus*** Mukerjee, 1981

1981. *Trimorus fasciatus* Mukerjee, *Rec. zool. Surv. India, Occ. Pap. No.,* **2** : 15

Distribution in India : Karnataka (Maldare)

19. ***Trimorus longispina*** Mukerjee, 1981

1981. *Trimorus longispina* Mukerjee, *Rec. zool. Surv. India, Occ. Pap. No.,* **2** : 17.

Distribution in India : Karnataka (Attur), Uttar Pradesh (Agra : Keetham)

20. ***Trimorus maldara*** Mukerjee, 1981

1981. *Trimorus maldara* Mukerjee, *Rec. zool. Surv. India, Occ. Pap. No.,* **2** : 19

Distribution in India : Karnataka (Maldare)

21. ***Trimorus nigricephalus*** Mukerjee, 1981

1981. *Trimorus nigricephalus* Mukerjee, *Rec. zool. Surv. India, Occ. Pap. No.,* 2

Distribution in India : Karnataka (Attur)

22. ***Trimorus (Neotrimorus) scutellospinosus*** Rajmohana & Narendran, 1997

1997. *Trimorus (Neotrimorus) scutellospinosus* Rajmohana & Narendran *J. Adv. Zool.,* **18**(1) : 32-37

2007. *Trimorus (Neotrimorus) scutellospinosus* Rajmohana & Narendran : in Rajmohana K, *Fauna of Kudremukh National Park, Conservation Area Series,* **32** : 67.

Distribution in India : Karnataka (Kudremukh Wildlife Sanctuary : Hanumangundi); Kerala (Wyanad : Muthanga)

Subfamily SCELIONINAE

Genus ***Calliscelio*** Ashmead, 1893

23. ***Calliscelio orientalis*** Sharma, 1981

1984. *Calliscelio orientalis* Sharma. *Mem. Sch. Ent., St. John's College,* **5** : 34

1982. Mani & Sharma, 1982, *Oriental Ins.,* **16** : 179

Distribution in India : Karnataka (Attur, Maldare, Dubare), Kerala (Idukki : Moozhiyar, Achankovil, Cardamom Hills); West Bengal : Raja Bhat Khawa, Kausani : Kumaon.

Genus ***Dicroscelio*** Kieffer, 1913

24. ***Dicroscelio deccanensis*** (Sharma, 1978)

1978. *Anteromorpha deccanensis* Sharma, 1978 (in Saraswat & Sharma 1978) *Mem. Sch. Ent, St. John's College,* **5** : 20.

1980. *Anteromorpha deccanensis* Sharma, *Oriental Ins.*, **14** : 387.

1982. *Anteromorpha deccanensis* Sharma : in Mani & Sharma, 1982 : *Oriental Ins.,* **16** :175

Distribution in India : Karnataka (Maldare, Burliar, Dubare), Maharashtra (Mahabaleshwar : Satara Road, Anjmali Road, Khajuraho : Harsa, Panna-Satara Road; Himachal Pradesh : Dalhousie (Kalatop)

25. ***Dicroscelio glaber*** (Sharma, 1982) in Yoder, Valerio, Masner & Johnson, 2009

1982. *Anteromorpha glabra* Sharma, *Rec. zool. Surv. India,* **79** : 319

2003. *Dicroscelio glaber* (Sharma, 1982) in Yoder, Valerio, Masner & Johnson, *Zootaxa* : 8

Distribution in India : Karnataka (Maldare, Hudukeri)

Genus ***Gryon*** Haliday, 1833

26. ***Gryon fulviventris*** (Crawford, 1912)

1912. *Hadronotus fulviventris* Crawford. *Proceedings of the U.S. National Museum,* **42** : 2

1982. Gryon fulviventris (Crawford) Sharma, *Rec. zool. Surv. India*, **79** : 336

Distribution in India : Karnataka (Hogenakal, Mysore, Bangalore), Uttar Pradesh (Golagokaranath), Tamilnadu (Thanjavur), Kerala (Malappuram, Idukki : Achankovil : Cardamom hills.

Host : Ex. eggs of *Antestiopsis cruciata* on Jasmine; Ex. eggs of *Nezara viridula*; Ex eggs of *Clavigralla gibbosa.*

27. ***Gryon gonikopalensis*** Sharma, 1982

1982. *Gryon gonikopalensis* Sharma, *Rec. zool. Surv. India,* **79** : 336

Distribution in India : Karnataka (Gonikopal)

28. ***Gryon hogenakalensis*** Sharma, 1982

1982. *Gryon hogenakalensis* Sharma. *Rec. zool. Surv. India*, **79** : 327

Distribution in India : Karnataka (Hogenakal), Kerala (Mallappuram, Idukki : Achankovil : Cardamom Hills)

29. ***Gryon krishnagiriensis*** Sharma, 1982

1982. *Gryon krishnagiriensis* Sharma, *Rec. zool. Surv. India,* **79** : 333

Distribution in India : Karnataka (Mudigeri), Maharashtra (Thana hills, Bombay); Tamilnadu (Parikatti).

30. ***Gryon mudugeriensis*** Sharma, 1981

1981. *Gryon mudugeriensis* Sharma, 1981. *Rec. zool. Surv. India,* **79** : 333

Distribution in India : Karnataka (Mudigeri); Tamilnadu (Thanjavur)

Genus ***Duta*** Nixon, 1933

31. ***Duta polita*** Rajmohana, 2007

2007. *Duta polita* Rajmohana, *Fauna of Kudremukh National Park, Conservation Area Series*, **32** : 50

Distribution in India : Karnataka (Kudremukh National Park : Bhagavathi)

Genus ***Idris*** Förster, 1856

32. ***Idris appangalus*** Mukerjee, 1981

1981. *Idris appangalus* Mukerjee, *Rec. zool. Surv. India, Occ. Pap. No.,* **2** : 35

Distribution in India : Karnataka (Coorg : Appangala)

33. ***Idris brachystigmatis*** (Mani & Mukerjee, 1976)

1976. *Gryon brachystigmatis* Mani & Mukerjee, *Oriental Ins.*, **10** : 498

Distribution in India : Karnataka (Mercara); Kerala (Idukky : Moozhiyar-Thekkady road, Moozhiyar : Cardamom Hills, Malappuram : Nilambur)]

34. ***Idris coorgensis*** (Mani & Mukerjee, 1976)

1976. *Gryon coorgensis* Mani & Mukerjee, *Oriental Ins.,* **10** : 498

Distribution in India : Karnataka (Gonikopal, Appangala)

35. ***Idris dubarensis*** Mukerjee, 1981

1981. *Idris dubarensis* Mukerjee, *Rec. zool. Surv. India, Occ. Pap. No.,* **2** : 37

Distribution in India : Karnataka (Dubare)

36. ***Idris mysorensis*** Mukerjee, 1978

1978. *Idris mysorensis* Mukerjee, *Mem. Sch. Ent*, St. John's College, **5** : 63

Distribution in India : Karnataka (Mysore, Bandipur)

37. ***Idris stigmaticus*** (Mani & Mukerjee, 1976)

1976. *Gryon stigmaticus* Mani & Mukerjee, *Oriental Ins.,* **10** : 497

Distribution in India : Karnataka (Mudigere)

38. ***Idris triangularis*** Mukerjee, 1981

1981. *Idris triangularis* Mukerjee, *Rec. zool. Surv. India Misc. Publ. Occ. Pap.* No., 2

Distribution in India : Karnataka : Coorg (Thalacauvery)

Genus ***Macroteleia*** Westwood, 1835

39. ***Macroteleia indica*** Sharma, 1978

1978. *Macroteleia indica* Sharma : in Saraswat & Sharma, *Mem. Sch. Ent.*, St. John's College **5** : 11

1982. *Macroteleia indica* Sharma, Saraswat CG, *Rec. zool. Surv. India,* **79** : 346

Distribution in India : Karnataka (Maldare, Dubare), Uttaranchal : Dehradun (Rishikesh); West Bengal : Alipur Duar (Hasimara); Kerala : Idukki (Moozhiyar), Palghat (Walayar).

Genus ***Paridris*** Kieffer, 1908

40. ***Paridris armigera*** Rajmohana, 2007

2007. *Paridris armigera* Rajmohana, *Fauna of Kudremukh National Park, Conservation Area Series,* **32**

Distribution in India : Karnataka (Kudremukh National Park : Karaekatte, Bhagavathi, Hanumangundi)

41. ***Paridris coorgensis*** Sharma, 1978

1978. *Paridris coorgensis* Sharma, in Saraswat & Sharma, *Mem. Sch. Ent*, St. John's College, **5** : 26

Distribution in India : Karnataka (Appangala)

42. ***Paridris dubeyi*** Sharma 1982

1982. *Paridris dubeyi* Sharma. *Rec. zool. Surv. India,* **79** : 336

Distribution in India : Karnataka (Attur)

43. ***Paridris karnatakensis*** Sharma, 1982

1982. *Paridris karnatakensis* Sharma. *Rec. zool. Surv. India,* **79** : 338

Distribution in India : Karnataka (Maldare, Hudukeri, Attur)

44. ***Platyscelio pulchricornis*** Kieffer, 1905

1905. *Platyscelio pulchricornis* Kieffer, *Annali del Museo Civico di Storia Naturale Giacomo Doria* (Genova), **2**(2) : 13

Distribution in India : Karnataka (Mandya); Orissa (Bhubaneshwar) (Examined in the collection at Project Directorate of Biological Control, Bangalore, Karnataka)

Host : Ex. Orthopteran egg on paddy leaf from Mandya; Ex. Eggs of *Tryporyza incertulas* from Bhubaneshwar

Genus ***Probaryconus*** Kieffer, 1908

45. ***Probaryconus cauverycus*** Saraswat, 1978

1978. *Probaryconus cauverycus* Saraswat in Saraswat & Sharma. *Mem. Sch. Ent*, St. John's College, **5** : 22

Distribution in India : Karnataka (Maldare, Thalacauvery)

Genus ***Psilanteris*** Kieffer, 1916

46. ***Psilanteris coriacea*** Rajmohana, 2007

2007. *Psilanteris coriacea* Rajmohana, *Fauna of Kudremukh National Park, Conservation Area Series,* **32** : 57

Distribution in India : Karnataka (Kudremukh National Park : Karaekatte, Bhagavathi), Kerala (Malappuram : Kadalundi)

47. ***Psilanteris ferruginus*** Rajmohana, 2007

2007. *Psilanteris ferruginus* Rajmohana, *Fauna of Kudremukh National Park, Conservation Area Series,* **32** : 60

Distribution in India : Karnataka (Kudremukh National Park : Bhagavathi)

48. ***Psilanteris orbitus*** Rajmohana, 2007

2007. *Psilanteris orbitus* Rajmohana, *Fauna of Kudremukh National Park, Conservation Area Series*, **32** : 61

Distribution in India : Karnataka (Kudremukh National Park : Muduba)

Genus ***Scelio*** Latreille, 1805

49. ***Scelio nilamburenis*** Mukerjee, 1979

1979. *Scelio nilamburenis* Mukerjee. *Mem. Sch. Ent*, St. John's College, **7** : 103

2007. *Scelio nilamburenis* Mukerjee, *Fauna of Kudremukh National Park, Conservation Area Series*, **32** : **65**

Distribution in India : Karnataka (Kudremukh National Park : Manikyadharabetta, Karaekatte, Bhagavathi, Hanumangundi)

Subfamily PLATYGASTRINAE

Genus ***Leptacis*** Förster

50. ***Leptacis atturensis*** Mukerjee, 1981

1981. *Leptacis atturensis* Mukerjee, *Rec. zool. Surv. India, Occ. Pap. No.,* **2** : 60

Distribution in India : Karnataka (Attur, Hudukeri)

51. ***Leptacis brachycerus*** Mukerjee, 1981

1981. *Leptacis brachycerus* Mukerjee, *Rec. Zool. Surv. India, Occ. Pap. No.,* **2** : 64

Distribution in India : Karnataka

52. ***Leptacis coorgensis*** Mukerjee, 1981

1981. *Leptacis coorgensis* Mukerjee, *Rec. Zool. Surv. India, Occ. Pap. No.,* **2** : 65

Distribution in India : Karnataka

53. ***Leptacis maldarensis*** Mukerjee, 1981

1981. *Leptacis maldarensis* Mukerjee : Mukerjee, *Rec. zool. Surv. India, Occ. Pap. No.,* **2** : 67

Distribution in India : Karnataka

Genus ***Inostemma*** Haliday, 1833

54. ***Insostemma coorgensis*** Mukerjee, 1981

1981. *Inostemma coorgensis* Mukerjee, *Rec. zool. Surv. India, Occ. Pap. No.,* **2** : 50

Distribution in India : Karnataka (Coorg)

55. ***Inostemma dalhausianum*** Mukerjee. 1981

1981. *Inostemma dalhausianum* Mukerjee, *Rec. zool. Surv. India, Occ. Pap. No.,* **2** : 50

Distribution in India : Karnataka (Nagerhole)

56. ***Inostemma nelgiense*** Mukerjee, 1981

1981. *Inostemma nelgiense* Mukerjee, *Rec. zool. Surv. India, Occ. Pap. No.,* **2** : 50

Distribution in India : Karnataka (Nelgi)

Genus ***Synopeas*** Förster, 1856

57. ***Synopeas atturense*** Mukerjee, 1981

1981. *Synopeas atturense* Mukerjee, Mukerjee, *Rec. zool. Surv. India, Occ. Pap. No.,* **2** : 74

Distribution in India : Karnataka (Attur)

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Rajmohana K., 2006b. Studies on Proctotrupoidea and Platygastroidea (Hymenoptera : Insecta) of Kerala. *Mem. Zool. Surv. India*, **21**(1) : 1-153.

Rajmohana K., 2006a. *A checklist of Scelionidae (Platygastroidea : Hymenoptera) from India, Zoos'* Print Journal, **21**(12) : 2506-2513.

Rajmohana K., 2007. *Insecta : Scelionidae (Platygastroidea) : Hymenoptera. Fauna of Kudremukh National Park, Conservation Area Series,* **32** : 49-69

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Fauna of Karnataka, State Fauna Series, **21** : 225-232, 2013

CENTIPEDES (CHILOPODA : SCOLOPENDROMORPHA)

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INTRODUCTION

The paper deals with the scolopendrid centipedes known to have been recorded from Karnataka state. The compilation is based on the records of the authors like Attems (1930), Jangi and Dass (1984), Khanna (2001 and 2005). Out of the 102 species of the scolopendrid centipedes, check listed by Khanna (l.c) from India, only nine species belonging to four genera viz. *Scolopendra* (four species), *Cormocephalus* (one *Ethmostigmus* (two species) and *Rhysida* (two species) have been documented from Karnataka, that includes besides their first reference, the valid names, synonymies, locality, location of types, description with illustrations, distribution, in India and elsewhere. The descriptions are based on the unpublished work of Khanna (2003).

While the type locality of *Ethmostigmus platycephalus cribifer* is in Mysore, *Scolopendra hardwickei* is quite common in Deccan. *Scolopendra morsitans* and *Scolopendra amazonica* occur commonly and sympatrically without hybridization.

SYSTEMATIC ACCOUNT

Class CHILOPODA

Order SCOLOPENDROMORPHA

1815. Scolopendrides. Leach, *Trans. Linn. Soc.*, London, 11: 382.

1907. Scolopendromorpha, Verhoeff, *Bronn, KL Ordng.*, **5** (II): 242.

Family SCOLOPENDRIDAE

1893. Subfamily Scolopendrinae + Scolopendropsinae, Bollman, *Bull. US Nat. Mus.*, **46** : 165.

1914. Scolopendridae, Attems, *Arch. naturges.* **80A**-4 : 101.

Tribe **Scolopendrini**

1906. Scolopendrinae, Verhoeff, *Acta Ac, Leop.*, **86** : 435.

1926. Scolopendrini, Attems, in *Kukenthal and Krumbach, Handbook. Zool.*, **4** : 373.

1. Genus ***Scolopendra*** Linnaeus, 1758

1758. *Scolopendra,* Linnaeus, *Syst. Nat.*, Ed. **10th** : 637.

1987. *Trachycormocephalus,* Kraepelin, Lewis, *J. nat. Hist.*, **20** : 1083-1088

Type Species : *Scolopendra morsitans* Linnaeus. The type species was designated by ICZN through its plenary powers (Opinion 454, 15 March 1957), in response to petition 843 by Crabill (1955, *Bull. Zool. Nomen.*, **11** : 134-136)

Distribution : India : Throughout.

Elsewhere : In all tropical and temperate zones of the world.

1. ***Scolopendra morsitans*** Linnaeus, 1758

1758. *Scolopendra morsitans* Linnaeus, *Syst. Nat.*, Ed. **10** : 638.

1903. *Scolopendra morsitans*, Kraepelin, *Mitt. Mus.*, Hamburg, **20** : 250.

1977. *Trachycormocephalus jodhpurensis*, Khanna, *Orient. Ins.*, **11**(1) : 151-156.

Type Locality : India

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Description : Body length : 60-135mm, including antennae and anal legs. Colour : The species occurs in various colour forms in different ecological habitats and at different stadia of growth and development; Cephalic plate, maxillipedes and Ist segment of the tergite varies from brownish-yellow to dark-orange, some dark-olive–green to black; Antennae yellow to tan brown with proximal segments bluish green, changing to yellow in the distal half; tergal segment varying in colour from dark green to brownish yellow or blackish green, usually with a light and contrast colored posterior tergal margins, giving the specimens externally a banded appearance; Endtergite, walking legs and sternites yellow or light yellowish green. The juveniles are light green in colour. On the basis of large variety of colour forms a number of species and sub species have been described under different names. Antennae : Long, 17-23 segmented (usually 20 or 21, sometimes 19, rarely 17, 18, 22 or 23), with 7 or 8 basal segment glabrous. Antennae, when reflexed reaching behind to 6th tergal segments. Head : Cephalic plate smooth, sparsely punctate and without any sulcus. Coxosternum : Base of the coxosternum smooth, without furrows, however, a very weak median sulcus extending posteriorly from the base of the dental plate is visible; dental plate mostly with 4+4 teeth, rarely with 3+3 or 6+6 teeth; post dental spur present coming out from a shallow depression. Arrangement of teeth index is also variable from all separate to 3 mesal coalesced and outer separate or all irregularly disposed. Tergites : Smooth, 2-20 tergal segments with a pair of complete paramedian longitudinal furrows; emargination of tergites begins normally from 10th segment, but occasionally in some larger specimen it is seen beginning still earlier, whereas in juveniles it is too less represented in anterior segments or it may be half complete. Endtergite wider than longer with convexed posterior margin and presence of acomplete median furrow. Sternites : Smooth; paramedian longitudinal furrows complete on 2-20 segments; endsternite gradually narrowing behind with its lateral margins convexed a little in some cases, normally straight; median sulcus on endsternite absent. Legs : 1-19 pair of walking legs with 1 spur to its first tarsal segment. Tarsal spur present on 20th pair of legs; 1-20 pair of walking legs with 2 spurs to the terminal claws. Coxopleura : Process of the of the coxopleura long to short but wide, conical, slender and cylindrical, densely punctate with its porose area extending on each side of the median ridge to the posterior edge; at the apex again with spines varying from 2-5 in number, generally 5 on each side with a lateral spine. Anal legs : The prefemur of the anal legs may be short or long,with 3 rows of 3 spines each ventrally, 2 rows of 4-6 spines each dorsally. The anal leg prefemur and femur in the males dorsally flat with a round ridge on the lateral margins, which is a character that merits for sexual dimorphism in the specie *Scolopendra morsitans*. However, the ridge is smooth in females and juveniles. Note : 1. Only in few species like *S. morsitans* and *Cormocephalus dentipes* etc., the centipedes have sexually dimorphic individuals, otherwise in all the species of centipedes the sexes are alike. The species *S. morsitans* has much morphological characters in common with its sibling the *Scolopendra amazonica*, from which it, however, differs in not having tarsal spur on 20th pair of legs. Both the species occur sympatrically without hybridization.

Distribution : India : Assam, Arunachal Pradesh, Andhra Pradesh, A & N Isl., Bihar, Bengal, Delhi, Gujarat, Himachal Pradesh, Haryana, Jammu and Kashmir, Karnataka, Kerala, Maharashtra, Madhya Pradesh, Meghalaya, Manipur, Mizoram, Nagaland, Punjab, Rajasthan, Tamilnadu, Tripura, Sikkim, Uttar Pradesh and Uttarakhand, Orissa,

Zoogeographical Distribution : Africa; Australia; India; Pacific Islands; Papua New Guinea; Philippines; South America; USA.

Notes : Frequently introduced.

2. ***Scolopendra subspinipes dehaani*** Brandt 1840

1840. *Scolopendra subspinipes dehaani*, Brandt, *Bull. Ac. St.*, Petersburg, **5** : 152.

1930. *Scolopendra subspinipes dehaani*, Attems, *Scolopendromorpha. Das Tierr.*, **54**(2); 51.

Synonym(s) : *Scolopendra childreni* Newport, 1844; *Scolopendra concolor* Newport, 1845; *Scolopendra fissispina* L. Koch, 1865; *Scolopendra faveolata* Verhoeff, 1937; *Scolopendra horrida* C.L. Koch, 1847; *Scolopendra inermipes* C.L. Koch, 1847; *Scolopendra inermis* Newport, 1845; *Scolopendra limicolor* Wood, 1861; *Scolopendra lucasii* Gervais, 1847; *Scolopendra silhetensis* Newport, 1845

Type locality : Indonesia, Java

Description : Length : 119 mm (Largest form of the subspinipes group). Antennae : 18-19 segmented with its 6 basal segments glabrous and rest pilose. Cephalic plate : smooth, punctate and more or less roundish. Tergites : 1, 2, and 21 without longitudinal sutures; 3-5 and 20 with a pair of incomplete and 6-19 with complete paramedian longitudinal sutures; lateral emargination beginning rather feebly and indistinctly on 7th segment. Sternites : 2-20 with a pair of paramedian longitudinal furrows, not reaching posteriorly on 19 and 20 segment; 21st markedly elongate, gradually narrowing cauded, slightly incurved laterally at about one third of its long stretch from anterior and having rounded posterior corners and straight posterior border. Maxillipedes : coxosternal plate without sutures; dental plate broader than long, each bearing a post dental spur and 4-5 teeth, the outer 2 being distinctly spaced and rest partly united; median prefemoral process thumb-like and toothed. Coxopleura : pores minute and dense, porous area extending dorsally almost right up to border; Coxopleural process conical, moderately long and tipped with 2 spines; posterior spine absent. Legs : all legs with 2 claw spurs; 1-20 with 1 tarsal spur and 21 without it; anal leg prefemur bearing a lone dorso-medial spine, and 2 on the tip of postero-medial process; Ist tarsus nearly 2-1/3 times longer than IInd.

Distribution : India : Assam, A & N Isl., Kerala, Karnataka, Maharashtra, Madhya Pradesh, Tamil Nadu, Uttar Pradesh, Uttarakhand and West Bengal.

Elsewhere : Sumatra, Java, Malaysia, Myanmar, Thailand, India, China (Indo-Malayan/ Indo-Chinese)

Notes : The true subspecific composition of *Scolopendra subspinipes* Leach, 1815 has yet to be determined, as the widespread introductions of the various forms have masked their original, native distributions.

3. ***Scolopendra hardwickei*** Newport 1844

1844. *Scolopendra hardwickei*, Newport, *Ann. Nat. Hist.*, **13** : 96.

1903. *Scolopendra subspinipes* var. *hardwickei*, Kraepelin, *Mitt. Mus.*, Hamburg, **20** : 262.

Synonym(s) : *Scolopendra bicolor* Humbert, 1865; *Scolopendra histrionica* C.L. Koch, 1847

Type locality : India.

It is the largest and perhaps the most dangerous species of the Scolopendridae from India, but unfortunately rare in distribution.

Description : Length : 160 mm. Colour : Head and 2, 4, 6, 9, 11, 13, 15, 17 and 19 leg bearing tergal segments dark brown or dark green alternating with yellow to yellow-brownish segments, a typical colour pattern not met within any other Scolopendrid centipede. Antennae and legs brownish yellow; both tarsi of 20 and 21st pair of legs blackish. Cephalic Plate : Moderately dense and finely punctate cephalic plate.

Antennae : Long, 17 or 18 segmented with 6-7 basal segments glabrous, punctate, rest of the segments with extremely small, rather indistinct plumes; reflexed antennae reaching back to 4th tergal segment; the segments of the posterior half long drum like. Maxillipedes : The dental plate of

the coxosternum significantly broader than long with 6-12 very small, indistinctly separate teeth; the median hook of the teeth prefemur very weak; base of the coxosternum punctate, without furrows. Tergite : 3-20 with fine, complete paramedian longitudinal furrows; emargination begins from the segments between 5-15; Endtergite without furrows, posteriorly arched, the lateral emargination slightly more pronounced. Sternite : 2-20 with sharp, complete paramedian longitudinal furrows; endsternite posteriorly tapering with its hind margin rounded. Walking Legs : 1-20 pair of walking legs with one tarsal spur; it may be absent on 20th pair of legs; all pair of legs withpurs to the claws. Coxopleura : Process of the coxopleura very small with one spine at the apex; pore small,sparse reaching up to the end. Anal legs : Relatively small and thick anal legs; prefemur of the anal legs ventrally without thorns, medially with 0-1, dorso-medially with 0-1, only exceptionally with 2 thorns; Eckdorn with 2 spines.

Distribution : India : A & N Isl., Andhra Pradesh, Karnataka, Maharashtra, Tamil Nadu and West Bengal.

Elsewhere : Sri Lanka, Sumatra (Indo-Malayan)

4. ***Scolopendra amazonica*** (Bucherl) 1946

1946. *Scolopendra morsitans amazonica*, Bucherl, *Mem. Inst. Butantan*, **19** : 135-137.

Type Locality : Brazil, Amazonia, vicinity of Manaus.

It is a medium sized and most dominant species of Scolopendridae, occurring often sympatrically with its sibling, the *Scolopendra morsitans.*

Description : The species is different from *Scolopendra morsitans* Linnaeus in not having the tarsal spur on 20th pair of walking legs, which is present in *morsitans.*

Body length : 15-65 mm, including antennae and anal legs. Colour : The species occurs in various colour forms. Cephalic plate, maxillipedes and Ist segment of the tergite varies from brownish yellow to dark orange, sometimes dark olive–green to black. Antennae yellow to tan brown. Antennae : Long, 19 segmented not more than six basal segments glabrous. Antennae when reflexed reaching behind to 6th tergal segments. Head : Cephalic plate smooth, sparsely punctate and without any sulcus. Coxosternum : Base of the coxosternum smooth, without furrows, however, a very weak median sulcus extending posteriorly from the base of the dental plate is visible; dental plate mostly with 4+4 teeth; post-dental spur present. Tergites : Smooth, 2-20 tergal segments with a pair of complete paramedian longitudinal furrows; emargination of tergites begins normally from 17th segment. End-tergite wider than longer with convexed posterior margin and presence of a complete median furrow. Sternites : Smooth; paramedian longitudinal furrows complete on 2-20 segments; endsternite gradually narrowing behind with its lateral margins convexed a little in some cases, normally straight; median sulcus on endsternite absent. Legs : 1-19 pair of walking legs with 1 spur to its first tarsal segment. Tarsal spur absent on 20th pair of legs; 1-20 pair of walking legs with 2 spurs to the terminal claws. Coxopleura :The process of the coxopleura long to short but wide, conical, slender and cylindrical, densely punctate with its porose area extending on each side of the median ridge to the posterior edge; at the apex again with spines varying from 2-5 in number, generally5 on each side with a lateral spine. Anal legs : The prefemur of the anal legs may be short or long, with 3 rows of 3 spines each ventrally, 2 rows of 4-6 spines each dorsally.

Note : The species *S. morsitans* has much morphological characters in common with its sibling the *Scolopendra amazonica*, from which it, however, differs in not having tarsal spur on 20th pair of legs. Both the species occur sympatrically without hybridization. A valid species different from *Scolopendra morsitans* Linnaeus, 1758 (Jangi & Dass, 1984 *J. Sci. Ind. Res.*, **43** : 51).

Distribution : India : A & N Isl., Delhi, Goa, Gujarat, Kerala, Karnataka, Madhya Pradesh,

Maharashtra, Rajasthan, and Tamilnadu, Uttar Pradesh and Uttarakhand.

Elsewhere : Brazil, North and South America, Australia, Sudan.

2. Genus ***Cormocephalus*** Newport, 1844

1844. *Cormocephalus,* Newport, *Trans. Linn. Soc.*, London, **19** : 275

1903. *Cormocephalus* + *Cupipes* + *Psiloscolopendra*+ *Hemicormocephalus* + *Hemiscolopendra* + *Colobopleurus*, Kraepelin, *Mitt. Mus., Hamburg*, **20** : 174- 217.

Type Species : *Cormocephalus rubriceps* (Newport).

Type Locality : New Zealand

Distribution : Southern Europe, Spain, Greece (Palaearctic); India, Bangladesh, Sri Lanka, Philippines (Oriental), Africa, Madagascar, Tasmania (Ethiopian); New Guinea, Australia (Australian Region); Central America, South America, West Indies (Neotropical) and Caroline Isls., Solomon Isls., Loyalty Isls., Lord Homes Islands, Galapagos Islands (All Tropical and Subtropical lands)

5. ***Cormocephalus nudipes*** Jangi and Dass 1984

1984. *Cormocephalus nudipes*, Jangi and Dass, *J. Scient. Indl. Res.*, **43**(2) : 34-35.

Type Locality : Tiger Valley, Nalgaonda (Andhra Pradesh)

Location of the Types : NZC, Zoological Survey of India.

Repository of the Types : NZC, Zoological Survey of India.

Description : Length : 55 mm approximate. Antennae : 16 segmented with 6 basal segments glabrous except for a few tiny scattered setae, rest densely pilose. Cephalic Plate : punctate and with a short median notch and two anteriorly divergent longitudinal sutures in the posterior half; basal plates visible. Tergites : punctate; 1-20 segment with a pair of complete paramedian furrows, first 2 with 2 additional pair of short sutures at anterior margin, the outer tending to be antero-lateral and oblique and present on the succeeding tergite too, 21st with a posteriorly incomplete longitudinal median suture; lateral emargination on 23-21, weak on 13. Sternites : punctate; 2-20 with a pair of complete paramedian sutures; 21 st tapering rather than abruptly and rather with more or less straight margins and rounded posterior corners. Maxillipedes : each dental plate bearing 4 teeth, the inner three united, and a post dental spur present; prefemur with a tridentate process, a larger ventro-medial and a smaller dorso-medial; coxosternal plate anteriorly with a pair of short obliquesutures and longitudinal median one forming inverted 'T' with a more transverse suture. Coxopleura : posteriorly moderately dense; each with a posterior spine and a moderately long rather slender-looking, conical process tipped with 2 almost equally strong spines, the dorsal being curved upwards. Legs : all without tarsal spur but possessing doubly spurred claw; anal leg prefemur with 2 spines on tip of moderately long and conical postero-medial process, a single longitudinal row of 3 dorso-medial spines, 5 rows of 3,3,3,2,4 ventral spines on right and 4 rows of 4,3,3,5 on left leg, besides an isolated one on former and a pair on latter situated antero-ventrally; anal leg tarsi glabrous and the Ist tarsus about 1-3/4 times longer than 2nd.

Distribution : India : Andhra Pradesh, Maharashtra and Karnataka.

Subfamily OTOSTIGMINAE

1903. Otostigminae, Kraepelin, *Mitt. Mus.*, Hamburg, **20** : 29, 64.

1930. Otostigminae, Attems, Scolopendromorpha, *Das Tierr.*, **54**(2) : 127.

3. Genus ***Ethmostigmus*** Pocock, 1898

1844. *Heterostoma,* Newport, *Trans. Linn. Soc.*, London, **19** : 275

1898. *Ethmostigmus*, Pocock, *Ann. nat. Hist. ser.*, **7**(1) : 327.

Type species : *Ethmostigmus trigonopodus* (Leach, 1817) - by subsequent designation. Fixed

by : Attems C. (1930) "*Myriopoda. 2. Scolopendromorpha*" *Das Tierreich. De Gruyter,* Berlin, **54** : 1-308, see p. 176.

Type Locality : Ethiopia

Distribution : Indo-Australian and Ethiopian region.

6. ***Ethmostigmus platycephalus cribifer*** (Gervais) 1847

1847. *Scolopendra cribifera*, Gervais, *Walckenaer, Hist. Apt.*, **4** : 248.

1930. *Ethmostigmus platycephalus cribifer*, Attems, Scolopendromorpha, *Das Tierr.*, **54**(2) : 182.

Type Locality : Mysore (Karnataka)

Description : Length 120 mm. Colour olive brown or yellowish-green with green posterior margins of the segments.Paramedian furrows on tergites begins from 3rd or 4th segment; emargination of tergites begins from 6th segment; tergites smooth;Coxosternum with 3+ 3 teeth, the inner with small side teeth; Sternites with median furrow and grooves from 6-19 segments; endsternite with a median furrow, posteriorly rounded; Process of the coxopleura very much extending behind the length of the endsternite, with one spine at the end, dorsally with 2-3 thorns, laterally with 2 thorns. Prefemur of the anal legs ventro-laterally with 3, ventro-medially with 2 or 3, dorso-medially with 4 thorns; Eckdorn simple, of normal size. 1-3 pair of walking legs with 2 tarsal spurs, 20th with or without tarsal spur.

Distribution : India : Karnataka.

Elsewhere : Sumatra, Palau Island, Amboynas, New Guinea, Kei Island (Indo-Australian).

7. ***Ethmostigmus platycephalus spinosus*** (Newport) 1845

1845. *Heterostoma spinosa*, Newport, *Trans. Linn. Soc.*, London, **19** : 414.

1930. *Ethmostigmus platycephalus spinosus*, Attems, Scolopendromorpha, *Das Tierr.*, **54** (2) : 181-182.

Type Locality : Sri Lanka

Repository of the Types : British Museum (Natural History)

Description : Process of the coxopleura at the apex with one spine, with 1 or 2 sub apical : the two spines somewhat drifted apart from each other; laterally with one thorn, some times that too with two minute thorns; prefemur of the anal legs ventro-laterally with 2, very seldom with 3, ventro-medially and medially with 1-2, dorso-medially mostly with 4, sometimes three thorns. Gigantically large Eckdorn, attenuate and conical among males or puffed up like a long process. Only first pair of legs with two tarsal spurs.

Distribution : India : Karnataka, Maharashtra and Tamilnadu.

Elsewhere : Sri Lanka, Myanmar (Oriental).

4. Genus ***Rhysida*** Wood, 1862

1862. *Rhysida,* Wood, *J. Ac. Philad.*, Ser. 2, **5** : 40

1930. *Rhysida,* Attems, Das Tierr., Scolopendromorpha, **54**(2) : 183.

Type Species : *Rhysida lithobioides* (Newport)

Distribution : Indo-Australian, Indo-Malayan, Ethiopian, Palaearctic and Neotropical.

8. ***Rhysida nuda nuda*** (Newport) 1845

1845. *Branchiostoma nudum*, Newport, *Trans. Linn. Soc.*, **19** : 412

1930. *Rhysida nuda nuda*, Attems, Scolopendromorpha, *Das Tierr.*, **54**(2) : 189-190.

1985. *Rhysida nuda*, Koch, *J.nat. Hist.*, **19** : 207.

Synonym(s) : *Branchiostoma obsoletum* Porat, 1876; *Branchiostoma subinerme* Meinert, 1886; *Rhysida defecta* Chamberlin, 1920; *Rhysida kurandana* Chamberlin, 1920

Type Locality : Australia (New Holland), Paramatta

Description : Length : 55 mm, including antennae and anal legs. Colour : Posterior segments of tergites olive green; cephalic plate bluish yellow to blackish green; 3 basal segments dark to lightbluish green, remaining yellow; sternites and legs yellow; distal part of the legs and nearly the whole of anal legs bluish. Antennae

: Very long antennae, 18-21 segmented; reflexed antennae reaching back to the end of the 6th tergal segments; 2 to 2-1/3 basal glabrous. Cephalic plate : sparsely punctate, without furrows, broader than long. Maxillipedes : Dental plate of the coxosternum broader than long with 4+4 teeth; a post dental spur present and embedded in a depression; base of the maxillipedes sparsely punctate, without furrows, however, 2 small divergent furrows are seen below the dental plate, meeting at an angle of 120^0. Tergite : Smooth and sparsely punctate; complete paramedian longitudinal furrows present from 3-19 segment; 2nd segment also with a very small, broken furrow; only endtergite laterally emarginate; both the lateral margins of the endtergite are almost parallel to ach other and the posterior margin converging a little to meet at an angle; very small median furrow visible at the posterior margin of the endsternite. Sternite : Sternites smooth paramedian longitudinal furrows are visible anteriorly on segments (Attems, 1930), however, the material under study by the present author has the sternal segments a bit granulose and paramedian furrows on sternites not at all visible. Endsternite tapering posteriorly with a median curve at its posterior margins and also a median sulcus running about 2/3rd of the endsternite anteriorly. Coxopleura : The process of the coxopleura moderately long, sparsely punctate with 2 apical spines and without dorsal or lateral spine; lateral sides of the porose area strongly trimmed. Walking legs; 1st pair of legs with 1 but without tibial spur; 2-18 with 2 spurs to first tarsal segment, 19th and 20th with one and 21st without tarsal spur; all legs with two spurs to the claws. Anal Legs : Prefemur of the anal legs long with 4 thorns; distal end of the prefemur with an incomplete transverse furrow; prefemoral process absent.

Distribution : Assam, Andhra Pradesh, Haryana, Karnataka, Meghalaya, Maharashtra, Madhya Pradesh, Orissa, Tamilnadu, Tripura and Uttar Pradesh.

Elsewhere : Myanmar, Sri Lanka, Australia, Paraguay, North America (Mexico), Paraguay (Indo-Australian, Neotropical).

Notes : Many published records of *Rhysida nuda* Newport, 1845 are probably referable to *Rhysida immarginata* (Porat, 1876), according to L.E. Koch (1985, *J. Nat. Hist*, **19** : 206)

9. ***Rhysida longipes longipes*** (Newport), 1845

1845. *Branchiostoma longipes*, Newport, *Trans. Linn. Soc.*, London, **19** : 411.

1930. *Rhysida longipes*, Attems, Scolopendromorpha, *Das Tierr.* **54**(2) : 194.

Synonym(s) : *Branchiostoma affines* Kohlrausch, 1878; *Branchiostoma gracile* Kohlrausch, 1878; *Branchiostoma longipes rotundatum* Haase, 1887; *Otostigmus simplex* Chamberlin, 1913; *Rhysida longipes brevicornis* Takakuwa, 1934

Type Locality : not stated.

Repository of the Types : British Museum (Natural History)

Repository of the Types : British Museum (Natural History)

Description : Length : 80 mm. Colour : Rusty yellow to olive brown. Cephalic Plate : Sparsely punctate. Antennae : 18 segmented; reflexed antennae reaching behind up to 6th tergal segment; basal three segments dorsally glabrous; only ventrally with small plumes. Maxillipedes : Dental plate of the coxosternum with 4 + 4 teeth and a postal dental spur; the basal furrow of the dental plate meeting almost at 1100; base of the coxosternum with a small median furrow anteriorly. Tergites : Paramedian longitudinal furrows on tergites beginning from 5th segment, mostly from 6th or seventh; emargination seldom begins earlier than 15^{th} segment. Sternites : Smooth; only small furrows visible anteriorly, endsternite tapering posteriorly sinuate. Legs : The First 7-12 pair of walking legs with 2, remaining up to 18th with one, 19th mostly with, 20th with or without tarsal spur. Coxopleura : The process of coxopleura long somewhat double the length

of the endsternite, with 3 spines at the apex, one lateral thorn and without dorsal thorn. Prefemur of the anal legs ventro-laterally with 3 or 4, ventro-medially with 1-3, dorsally with 2-3 thorns; Eckdorn present.

Distribution : Arunachal Pradesh, A & N Isl., Delhi, Goa, Karnataka, Maharashtra, Madhya Pradesh, Uttar Pradesh, Uttarakhand and West Bengal.

Elsewhere : Australia, Brazil, China, East and West Africa, Madagascar, Mauritius Maxico, Seychelles, Somalia; Central and South America South Asia; St. Kitts and Nevis; Tanzania; U.S. Virgin Islands (Oriental, Indo-Australian, Palaearctic, Ethiopian, Nearctic and Neotropical).

SUMMARY

Based on available references, the occurrence of nine species of Scolopendrid centipedes, from the Karnataka state, have been documented in the present communication.

ACKNOWLEDGEMENTS

The author is thankful to the Director, Zoological Survey of India, Calcutta and to Shri P.T. Bhutia, Officer-in-Charge, Northern Regional Station, ZSI, Dehra Dun for various facilities and encouragements. Thanks are also due to Late Dr. G. Thirumalai, Officer in Charge, Southern Regional Station, Zoological Survey of India, Chennai for assigning me to write this paper

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Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 233-237, 2013

SCORPIONIDA

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INTRODUCTION

Scorpions are the one of the oldest known arthropod group that underwent very little change during the course of evolution. They are also known as living fossils. Venom of only very few species are lethal to man.

A comprehensive account on the scorpion fauna of British India including Sri Lanka and Myanmar has been given by Pocock (1900). Subsequently Tikader and Bastawade (1983) updated the knowledge of Indian scorpions. They have listed 99 species and subspecies belonging to 18 genera under 5 families. Bastawade (1986a, b, 1992) added three more species to that list, Bastawade *et al.,* (2004) and Thulsi Rao *et al.,* (2005) enumerated the Scorpion/Arachnid fauna of Kerala State and Nallamalai Region of Eastern Ghats of Andhra Pradesh respectively.

Present paper deals with the scorpion fauna of Karnataka State. The Scientists of Zoological Survey of India, Southern Regional Station carried out extensive surveys of few districts, and Biligiri Rangaswamy W.L.S. and Bennergatta N.P in Karnataka state. 13 species belonging to three families and 6 genera are listed here.

SYSTEMATIC LIST

Order SCORPIONIDA

Family BUTHIDAE

1. *Mesobuthus tamulus tamulus* (Fabricius)
2. *Lychas (Endotrichus) tricarinatus* Simon
3. *Stenochirus politus* Pocock
4. *Isometrus (Reddyanus) brachycentrus* Pocock
5. *Isometrus (Reddyanus) thrustoni* Pocock
6. *Isometrus (Closotrichus) sankeriensis* Tikader and Bastawade

Family ISCHNURIDAE

7. *Iomachus laeviceps malabarensis* Pocock

Family SCORPIONIDAE

8. *Heterometrus (Gigantometrus) swammerdami* Simon
9. *Heterometrus (Chersonesometrus) scaber* (Thorell)
10. *Heterometrus (Chersonesometrus) wroughtoni* (Pocock)
11. *Heterometrus (Chersonesometrus) pelekomanus* Couzijn
12. *Heterometrus (Chersonesometrus) kanarensis* Pocock
13. *Heterometrus (Heterometrus) keralaensis* Tikader and Bastawade

1. ***Mesobuthus tamulu tamulus*** (Fabricius)

1798. *Buthus tamulus* Fabricius, *Ent. Syst, Suppt.,*: 294.

1983. *Mesobuthus tamulus tamulus,* Tikader and Bastawade, *The Fauna of India, Scorpions, Scorpionida, Arachnida Vol.* : **III** : 216-222.

Material Examined : 1 ex., Hallayalla, Haveri Dist., Karnataka, 13.9.07, Coll. S. Prabakaran.

Distribution : India : Nasik, Dhule, Nanded, Bhir, Aurangabad, Bombay, Poona, Ahmadnagar, Sholapur, Satara, Sangli and Kholapur, Maharashtra; Hyderabad, Andhra Pradesh; Bhavani Town, Tamil Nadu.

Remarks : This is the first report of this species from Karnataka State.

2. ***Lychas (Endotrichus) tricarinatus*** Simon

1884. *Lychas tricarinatus* Simon, *Ann. Mus. civ. Sto. na. Genova,* **20** : 371.

1983. *Lychas (Endotrichus) tricarinatus*, Tikader and Bastawade, *The Fauna of India, Scorpions, Scorpionida, Arachnida,* Vol, **III** : 73.

Material Examined : 1 ex., 1100 mts., 5.4 99, Coll. G.Thirumalai; 45 exs., Mutchinagunta, Alt. 780 mts., 29.6.02, Coll. M.B.Raghunathan; 11 exs., Udugabande, 11.9.03, Coll. G.Thirumalai ; 15 exs., Kutalla Halli, Alt. 780 mts., 16.9.03, Coll. G.Thirumalai; 2 exs., Swarnamuki Beet, Ramaswamy Pond, Alt. 810 mts., 13.9.03, coll. G. Thirumalai; 1 ex., Seetha Katte, 17.3.04, Coll. K. Rema Devi; 2 exs., Gubamadugu, 20.3.04, Coll. K. Rema Devi 5 exs., Sringeri, Chikmagalur Dist., 23.9.06, Coll. S. Prabakaran; 2 ex., Mahulli Betta, B.R.T.W.L.S., 9.9.06, Coll. S. Prabakaran.

Distribution : India : Bhopal, Madhya Pradesh; Belgam, Bangalore, Bannerghatta National Park,Mangalore, Kanara, Karnataka; Trivandrum, Kerala; Nellore, Andhra Pradesh; Tanjavur, Yercaud, in Shevory Hills, Nilgiris, Tamil Nadu.

Status : Very common. In Tamil Nadu large number of examples was collected from Kattupakkam Agricultural Farm near Chengalput, and Anamalai Reserve Forest and also from Bennerghatta national Park.

3. ***Stenochirus politus*** Pocock

1899. *Stenochirus politus* Pocock, *J.Bombay nat. Hist. Soc.*, **12** : 262.

1983. *Stenochirus politus*, Tikader and Bastawade, *The Fauna of India, Scorpions, Scorpionida, Arachnida*, Vol. : **III** : 153.

Material Examined : 1 ex., Hitchinagunta, Alt. 780 mts., 29.6.02, Coll. M.B. Raghunathan.

Distribution : India : Kanara, Bennerghatta National Park, Bangalore, Karnataka, Anamalai, Indra Gandhi Wild Life Scantuary, Tamil Nadu, Mandal National Park, Madhya Pradesh.

Status : Rare

4. ***Isometrus (Reddyanus) brachycentrus*** Pocock

1899. *Isometrus brachycentrus* Pocock, *J.Bombay nat. Hist. Soc.*, **12** : 263.

1983. *Isometrus (Reddyanus) brachycentrus,* Tikader and Bastawade,*The Fauna of India, Scorpions, Scorpionida, Arachnida*, Vol, **III** : 268-272.

Distribution : India : Mangalore, Karnataka; Indra Gandhi Wild Life Sanctuary, Tamil Nadu; Kerala.

Status : Rare.

Remarks : Not been collected in recent surveys of the State.

5. ***Isometrus (Reddyanus) thrustoni*** Pocock

1893. *Isometrus thrustoni* Pocock, *J. Bombay nat. Hist. Soc.*, **7**(3) : 297.

1983. *Isometrus (Reddyanus) thrustoni*, Tikader and *Bastawade, The Fauna of India, corpions, Scorpionida, Arachnida,* Vol. **III** : 273-280.

Distribution : India : Bhopal, Madhya Pradesh; Kholapur, Maharashtra; Belgaum, Karnataka; Cuddappha, Andhra Pradesh; Coonoor,Yercaud in Shevaroy Hills, Tiruchurapally, Thirunelveli, Tamil Nadu.

Status : Rare

Remarks : Not collected in recent years from Karnataka State.

6. ***Isometrus (Closotrichus) sankeriensis*** Tikader and Bastawade

1983. *Isometrus (Closotrichus) sankeriensis* Tikader and Bastawade, *The Fauna of India, Scorpions, Scorpionida, Arachnida,* Vol. **III** : 311-316.

Material Examined : 1 ex., Subramanya, D. Kannada, 15.4.99, Coll. G. Thirumalai; 1 ex., Kollur, 2.4.99, Coll. G. Thirumalai; 2 exs., Parathukatte to Bodipaduga, 28.9.2000, Coll. G. Thirumalai.

Distribution : India : Karwar, Karnatka; Silent Valley, Kerala.

Status : Rare

7. ***Iomachus laeviceps malabarensis*** Pocock

1900. *Iomachus laeviceps malabarensis* Pocock, *Fauna Brit. Indi, Arachn.*, : 82

1983. *Iomachus laeviceps malabarensis*, Tikader and Bastawade, *The Fauna of India, Scorpions, Scorpionida, Arachnida,* Vol. : **III** : 495-499.

Material Examined : 1 ex., Parashukatta to Budipaduga, 28.11.2000, Coll. G. Thirumalai.

Distribution : India : Mangalore, Biligiri Rangaswamy Wild Life Sanctuary, Bangalore, Karnataka, Kerala.

Status : Not very common.

8. ***Heterometrus (Heterometrus) keralaensis*** Tikader and Bastawade

1983. *Heterometrus (Heterometrus) keralaensis* Tikader and, Bastawade, *The Fauna of India, Scorpions, Scorpionida, Arachnida,* Vol. : **III** : 528-533.

Material Examined : 1 ex., Puttanakunte, Bannerghatta N.P., 17.3.04, Coll. K. Rema Devi.

Distribution : India : Meenumutty, New Amarambalam (R.F), Kerala.

Remark : New record to Karnataka and extension of range of distribution of this species which was earlier known from Kerala only.

Status : Rare.

9. ***Heterometrus (Gigantometrus) swammerdami*** Simon

1872. *Heterometrus (Gigantometrus) swammerdami* Simon, *Rev. et. Mag. Zool.*, **23**(2) : 56.

1983. *Heterometrus (Gigantometrus) swammerdami,* Tikader and, Bastawade, *The Fauna of India, Scorpions, Scorpionida, Arachnida,* Vol. : **III** : 562-567.

Distribution : India : Satara, Nagpur, Maharashtra; Raipur, Madhya Pradesh; Dehra Dun, Uttar Pradesh; Dharwar, Karnataka : Chennai, Tanjavur, Tamil Nadu; Nallamalais, eastern Ghats, Andhra Pradesh; Burdwan, Midanpore, West Bengal.

Elsewhere : Sri Lanka : Tricomalai and Chilan.

Status : Common.

Remarks : Though this species appears to have wider distribution, no fresh specimens could be collected in the recent surveys of the State.

10. ***Heterometrus (Chersonesometrus) wroughtoni*** (Pocock)

1899. *Heterometrus (Chersonesometrus) wroughtoni* (Pocock), *J. Bombay nat. Hist. Soc.*, **12** : 745.

1981. *Heterometrus (Chersonesometrus) wroughtoni*, Couzijn, *Zool. Verln.*, **184** : 158.

Distribution : Belgaum, Karnataka; Gadinglaj, Kohlapur, Dist., Maharashtra.

Status : Not very common.

Remarks : Not collected in recent surveys of the State.

11. ***Heterometrus (Chersonesometrus) scaber*** Thorell

1877. *Pandinus scaber* Thorell, *Atti. Soc. Ital.*, **19** : 202.

1899. *Heterometrus scaber*, Kraepelin, *Jb. hamb. wiss. Anst.*, **11** : 58.

1981. *Heterometrus (Chersonesometrus) scaber scaber,* Couzijn, *Zool. Verln.*, **184** : 144.

1983. *Heterometrus (Chersonesometrus) scaber*, Tikader and Bastawade, *The Fauna of India, Scorpions, Scorpionida, Arachnida,* Vol. **III** : 619-625.

Distribution : India : Trivandrum, Malabar, Kerala; Yelgit, Jetland in Managalore, Dharwar, Karnataka.

Status : Rare

Remarks : No specimens could be collected in the recent surveys of the State.

12. ***Heterometrus (Chersonesometrus) pelekomanus*** Vouzijn

1981. *Heterometrus (Chersonesometrus) pelekomanus* Vouzijn, *Zool. Verln.*, **184** : 137.

1983. *Heterometrus (Chersonesometrus) pelekomanus,* Tikader and Bastawade, *The Fauna of India, Scorpions, Scorpionida, Arachnida,* Vol. **III** : 641-646.

Distribution : India : Nilgiris, Tamil Nadu; Mysore, Bangalore, Karnataka; Tirumalai Hills, Tirupathi, Andhra Pradesh; Bombay, Maharashtra.

Status : Not very common.

Remarks : Not collected from Bangalore or Mysore in recent years.

13. ***Heterometrus (Chersonesometrus) kanarensis*** (Pocock)

1900. *Palamnaeus scaber kanaraensis* Pocock, *Fauna Brit. Inida, Arachn.*, : 93.

1981. *Heterometrus (Chersonesometrus) phipsoni kanaraensis,* Couzjin, *Zool. Verln.*, **184** : 151.

1983. *Heterometrus (Chersonesometrus) kanarensis,* Tikader and Bastawade, *The Fauna of India, Scorpions, Scorpionida, Arachnida,* Vol. **III** : 636-641.

Material Examined : 1 ex., Subramanya, 700 alt., 14.12.98, Coll. M.S. Ravichandran; 1 ex., Mnijur, Kodagu Dist., 700 mts., 12.12.98, Coll. M.S. Ravichandran; 1 ex., Road to Podithagadu, Alt. 1100 Mts., 5.4.99. Coll. G. Thirumalai; 4 exs., Road to Sebinakare, 5.4.99, Coll. G. Thirumalai; 24 exs., Sebinakare to Dorasanialla, Alt. 1140 mts., 27.2.2000 Coll.; 18 exs., Biligiri Rangaswamy temple Wildlife Sanctuary Hills, Alt. 900 mts., 29.2.2000, Coll. G. Thirumalai; 8 exs., Doddasempige, Alt.1000 mts., 2.3.2000, Coll. G. Thirumalai; 1 ex., Uduabande, 11.9.03, Coll. G.Thirumalai; 14 exs., Kutala Halli, Alt. ts., 16.3.03, Coll. G. Thirumalai; 13 exs., Muthyala Madugu, Alt.700 mts., 15.9.03, G.Thirumalai; 1 ex., Puttanakunte, 17.3.04, Coll. K. Rema Devi; 13 exs., Thatte kare, 19.3.04, Coll. K. Rema Devi, 21 exs., Jodukonta Plantation, 16.3.04, Coll. K. Rema Devi 10 exs., Mahulli Betta, B.R.T.W.L.S., 9.9.06, Coll. S. Prabakaran.

Distribution : India : Kanara, Biligiri Rangaswamy Wild Life Sanctuary, Bennerghatta Wild life Sanctuary, Bangalore, Karnataka; Bombay, Maharashtra; Parambikulam Reserve forest, Kerala.

Status : Very common in Karnataka State.

Remarks : Bastawade *et al.*, (2004) commented on the common occurrence of this species from Kerala parts of Western Ghats and also extended the range of distribution of this species to Kerala.

SUMMARY

Recent collections from Karnataka State and the earlier literature on the state consisted of 13 species of scorpions belonging to three families and 6 genera. Only six species could be collected during the recent surveys including the two new record, (Viz. *Mesobuthus tamulus tamulus*, Heterometrus (Heterometrus) keralaensis). *Lychas (Endotrichus) tricarinatus, Stenochirus politus, Iomachus, laeviceps malabarensis and Heterometrus (Chersonesometrus) kanarensis* .

ACKNOWLEDGEMENTS

The author is grateful to the Director, Zoological Survey of India, Kolkata to the Officer-in-Charge, Zoological Survey of India, Southern Regional Station, Chennai, for providing facilities and encouragements.

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Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 239-276, 2013

FRESHWATER FISHES

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INTRODUCTION

The Karnataka State with an area of 76,245 sq.km., situated on the Western edge of the Deccan Plateau forms a part of the densely forested Western Ghats from which the main east flowing rivers originate namely the Cauvery, Thungabadhra and Krishna. It includes smaller west flowing rivers viz. the Sharavathi river from which several new species are being described by recent workers. From the Southern Regional Station, Zoological Survey of India. Several Districts in Southern Karnataka were surveyed viz. Bangalore, Chickmagalur, Dakshin Kannada, Hassan, Kodagu, Kolar, Mandya , Mysore and Udipi and two sanctuaries viz. the Biligiri Rangaswamy Temple Sanctuary and the Bannerghatta National Park. Several new distributional records were observed. The present paper provides the ichthyofaunal diversity of the Katnataka State based on our collections and from published records. So far 213 species are known which includes 86 western ghat endemics and 13 species endemic to the state.

The present survey and study by the Southern Regional Station and the Western Regional Station has revealed the presence of 104 species from the districts surveyed of which 13 are new records to Karnataka. Only these species which have been actually collected by ZSI have been detailed in this paper. The systemtic list includes the first and most recent references, material examined (length range and register numbers for collections made by SRS), date of collection, name of collector, distribution and remarks wherever required.

FRESHWATER FISHES

(* & ** Endemic to Western ghats; ** Endemic to Karnataka part of Western Ghats)

Order OSTEOGLOSSIFORMES

Family NOTOPTERIDAE

1. *Notopterus notopterus* (Pallas)

Order ELOPIFORMES

Family MEGALOPIDAE

2. *Megalops cyprinoides* (Broussonet)

Order ANGUILIFORMES

Family ANGUILLIDAE

3. *Anguilla bengalensis* (Gray)
4. *Anguilla bicolor* McClelland

Order GONORHYCHIFORMES

Family CHANIDAE

5. *Chanos chanos* (Forsskal)

Order CYPRINIFORMES

Family CYPRINIDAE

Tribe **Chondrostomini**

6. *Hypophthalmichthys molitrix* (Valenciennes)
7. *Hypophthalmichthys nobilis* (Richardson)

Tribe **Oxygasterini**

8. *Salmophasia acinaces* (Valenciennes)*
9. *Salmophasia belachi* Jayaraj *et al.***
10. *Salmophasia boopis* (Day)*

**Western Regional Station, Secr.29, Vidya nagar, Akurdi, Rawet Road, Pune-411044.*

11. *Salmophasia clupeoides* (Bloch)
12. *Salmophasia horai* (Silas)*
13. *Salmophasia novacula* (Vlenciennes)*
14. *Salmophasia phulo* (Hamilton)
15. *Salmophasia untrahi* (Day)
16. *Barilius barna* (Hamilton)
17. *Barilius bakeri* Day*
18. *Barilius barila* (Hamilton)
19. *Barilius bendelesis* (Hamilton)
20. *Barilius canarensis* (Jerdon)**
21. *Barilius gatensis* (Valenciennes)*
22. *Barilius vagra vagra* (Hamilton)*
23. *Chela cachius* (Hamilton)
24. *Laubuca laubuca* (Hamilton)
25. *Esomus barbatus* (Jerdon)
26. *Esomus danricus* (Hamilton)
27. *Esomus thermoicos* (Valenciennes)
28. *Devario aequipinnatus* (Mc Clelland)
29. *Devario devario* (Hamilton)
30. *Devario fraseri* Hora*
31. *Devario malabaricus* (Jerdon)
32. *Brachydanio rerio* (Hamilton)
33. *Rasbora caverii* (Jerdon)
34. *Rasbora daniconius* (Hamilton)
35. *Rasbora labiosa* Mukerji*
36. *Rasbora rasbora* (Hamilton)
37. *Amblypharyngodon melettinus* (Valenciennes)
38. *Amblypharyngodon microlepis* (Bleeker)
39. *Amblypharyngodon mola* (Hamilton)
40. *Aspidoparia morar* (Hamilton)

Subfamily CYPRININAE

Tribe **Cyprinini**

41. *Ctenopharyngodon idellus* (Valenciennes)
42. *Cyprinus carpio carpio* (Linnaeus)
43. *Cyprinus carpio communis* (Linnaeus)
44. *Cyprinus carpio specularis* (Linnaeus)
45. *Carassius carassius* (Linnaeus)
46. *Thynnichthys sandkhol* (Sykes)*
47. *Tor khudree* (Sykes)*
48. *Tor musullah* (Sykes)*
49. *Tor neilli* (Day)*
50. *Neolissochilus waynaadensis* (Day)*

Tribe **Systomini**

51. *Osteobrama belangeri*(Valenciennes)
52. *Osteobrama cotio cunma* (Day)
53. *Osteobrama cotio peninsularis* Silas*
54. *Osteobrama dayi* (Hora & Misra)*
55. *Osteobrama neilli* (Day)*
56. *Osteobrama vigorsii* (Sykes)*
57. *Rohtee ogilbii* Sykes*
58. *Oreichthys cosuatis* (Hamilton)
59. *Puntius amphibius* (Val.)
60. *Puntius arulius arulius* (Jerdon)*
61. *Puntius bimaculatus* (Bleeker)
62. *Puntius cauveriensis* Hora*
63. *Puntius chola* (Hamilton)
64. *Pethia conchonius* (Hamilton)
65. *Puntius coorgensis* Jayaram*
66. *Puntius dorsalis* (Jerdon)
67. *Dravidia fasciatus fasciatus* (Day)*
68. *Dravidia fasciatus pradhani* Tilak*
69. *Dawkinsia filamentosus* (Val.)
70. *Puntius guganio* (Hamilton)
71. *Puntius melanostigma* (Day)*
72. *Puntius mudumalaiensis* Menon and Rema Devi*
73. *Pethia narayani* Hora*
74. *Puntius parrah* Day*
75. *Pethia phutunio* (Hamilton)
76. *Pethia setnai* Chhapgar and Sane*
77. *Pethia nigrofasciatus* Gunther*
78. *Puntius sharmai* Menon & Rema Devi
79. *Puntius sophore* (Hamilton)
80. *Pethia ticto* (Hamilton)
81. *Puntius vittatus* Day
82. *Neolissochilus bovanicus* (Day)*
83. *Gonoproktopterus carnaticus* (Jerdon)*

84. *Systomus sarana sarana* (Hamilton)
85. *Systomus sarana subnasutus* (Valenciennes)
86. *Gonoproktopterus dobsoni* (Day)*
87. *Gonoproktopterus dubius* (Day)*
88. *Gonoproktopterus kolus* (Sykes)*
89. *Gonoproktopterus kurali* Menon & Rema Devi*
90. *Gonoproktopterus lithopidos* (Day)*
91. *Gonoproktopterus micropogon* (Valenciennes)*
92. *Gonoproktopterus pulchellus* (Day)*
93. *Gonoproktopterus thomassi* (Day)*
94. *Osteochilichthys godavariensis* (Rao)*
95. *Osteochilichthys nashii* (Day)*
96. *Osteochilichthys thomassi* (Day)**
97. *Kantaka brevidorsalis* (Day)*
98. *Cirrhinus cirrhosus* (Bloch)
99. *Cirrhinus fulungee* (Sykes)*
100. *Cirrhinus mrigala* (Hamilton)
101. *Cirrhinus reba* (Hamilton)
102. *Catla catla* (Hamilton)
103. *Labeo ariza* (Hamilton)
104. *Labeo bata* (Hamilton)
105. *Labeo boga* (Hamilton)
106. *Labeo boggut* (Sykes)
107. *Labeo calbasu* (Hamilton)
108. *Labeo dussumieri* (Valenciennes)
109. *Labeo fimbriatus* (Bloch)
110. *Labeo kontius* (Jerdon)*
111. *Labeo nigrescens* Day
112. *Labeo pangusia* (Hamilton)
113. *Labeo potail* (Sykes)
114. *Labeo porcellus* (Heckel)
115. *Labeo rohita* (Hamilton)
116. *Schismatorhynchus (nukta) nukta* (Sykes)*

Subfamily GARRINAE

117. *Crossocheilus latius latius* Hamilton
118. *Garra bicornuta* Rao**
119. *Garra gotyla stenorhynchus* (Jerdon)*
120. *Garra mcClellandi* (Jerdon)*
121. *Garra mullya* (Sykes)

Family PARAPSYLORHYNCHIDAE

122. *Parapsilorhynchus prateri* Hora &Misra*

Family BALITORIDAE

Subfamily BALITORINAE

123. *Bhavania australis* (Jerdon)*
124. *Balitora mysorensis* Hora*

Subfamily NEMACHEILINAE

125. *Acanthocobitis botia* (Hamilton)
126. *Acanthocobitis mooreh* (Sykes)*
127. *Nemacheilus anguilla* Annandale*
128. *Schistura denisoni denisoni* (Day)*
129. *Schistura denisoni mukambbikaensis* Menon**
130. *Schistura kodaguensis* Menon**
131. *Schistura nagodiensis* Sreekantha, Gururaja, Rema Devi, Indra & Ramachandra**
132. *Schistura nilgiriensis* Menon*
133. *Schistura semiarmatus* (Day)*
134. *Schistura sharavathiensis* Sreekantha, Gururaja, Rema Devi, Indra & Ramachandra**
135. *Longischistura bimachari* (Hora)**
136. *Longischistura striatus* Day*
137. *Mesonemacheilus guentheri* (Day)*
138. *Mesonemacheilus petrubanarescui* (Menon)**
139. *Mesonemacheilus pulchellus* (Day)*
140. *Nemachlichthys ruppelli* (Sykes)*
141. *Nemachlichthys shimogensis* (Rao)**
142. *Oreonectes (Indoreonectes) evezardi* (Day)*

Family COBITIDAE

143. *Lepidocephalichthys guntea* (Hamilton)
144. *Lepidocephalichthys thermalis* (Valenciennes)
145. *Botia striatus* Rao*

Order SILURIFORMES

Family BAGRIDAE

146. *Batasio sharavathiensis* Anuradha Bhat & Jayaram**

147. *Rita kuturnee* (Sykes)
148. *Rita pavimentata* (Valenciennes)
149. *Horabagrus brachysoma* (Gunther)*
150. *Mystus armatus* (Day)*
151. *Mystus bleekeri* (Day)
152. *Mystus cavasius* (Hamilton)
153. *Mystus krishnensis* Ramakrishnaiah
154. *Mystus keletius* (Valenciennes)
155. *Mystus malabaricus* (Jerdon)*
156. *Hemibagrus menoda* (Hamilton)
157. *Mystus montanus* (Jerdon)
158. *Hemibagrus punctatus* (Jerdon)*
159. *Mystus vittatus* (Bloch)
160. *Sperata aor* (Hamilton)
161. *Sperata seenghala* (Sykes)

Family SILURIDAE

162. *Ompok bimaculatus* (Bloch)
163. *Ompok malabaricus* (Valenciennes)*
164. *Ompok pabda* (Hamilton)
165. *Wallago attu* (Bloch & Schneider)

Family SCHILBEIDAE

166. *Proeutropiichthys taakree* (Sykes)
167. *Silonia childreni* (Sykes)*
168. *Neotropius khavalchor* Kulkarni
169. *Eutropiichthys goongwaree* (Sykes)
170. *Eutropiichthys vacha* (Hamilton)

Family PANGASIIDAE

171. *Pangasius pangasius* (Hamilton)

Family AMBLYCIPITIDAE

172. *Amblyceps mangois* (Hamilton)

Family SISORIDAE

173. *Bagarius yarrelli* (Sykes)*
174. *Nangra itchkea* (Sykes)
175. *Nangra viridescens* (Hamilton)
176. *Glyptothorax lonah* (Sykes)*
177. *Glyptothorax madraspatanam* (Day)*
178. *Glyptothorax trewasae* Hora*

Family CLARIIDAE

179. *Clarias batrachus* (Linnaeus)
180. *Clarias dussumieri* (Valenciennes)*

Family HETEROPNEUSTIDAE

181. *Heteropneustes fossilis* (Bloch)

Order MUGILIFORMES

Family MUGILIDAE

182. *Rhinomugil corsula* (Hamilton)

Order BELONIFORMES

Family ADRIANICHTHIDAE

183. *Oryzias setnai* Kulkarni

Family BELONIDAE

184. *Xenentodon cancila* (Hamilton)

Order CYPRINODONTIFORMES

Family APLOCHEILIDAE

185. *Aplocheilus blocki* (Arnold)
186. *Aplocheilus lineatus* (Valenciennes)*
187. *Aplocheilus panchax* (Hamilton)

Family POECILIDAE

188. *Gambusia affinis* (Baird and Girard)
189. *Poecilia reticulata* (Peters)

Order SYNBRANCHIFORMES

Family MASTACEMBELIDAE

190. *Macrognathus aculeatus* (Bloch)
191. *Macrognathus aral* (Bloch)
192. *Mastacembelus armatus* (Lacépède)
193. *Macrognathus pancalus* (Hamilton)

Order PERCIFORMES

Family CHANDIDAE

194. *Chanda nama* (Hamilton)
195. *Parambassis ranga* (Hamilton)
196. *Parambassis thomasi* (Day)*

Family NANDIDAE

197. *Pristolepis marginatus* (Jerdon)*

Family CICHLIDAE

198. *Etroplus canarensis* Day**
199. *Etroplus maculatus* (Bloch)
200. *Etroplus suratenisis* (Bloch)
201. *Oreochromis mossambica* (Peters)

Family GOBIIDAE

202. *Awaous stamineus* (Valenciennes)

203. *Glossogobius giuris* (Hamilton)
204. *Redigobius romeri* (Weber)

Family ANABANTIDAE

205. *Anabas testudineus* (Bloch)

Family BELONTIDAE

206. *Pseudosphromenus cupanus* (Valenciennes)
207. *Osphronemus goramy* Lacepede

Family CHANNIDAE

208. *Channa leucopunctatus* (Sykes)
209. *Channa marulius* (Hamilton)
210. *Channa gachua* (Bloch & Schneider)
211. *Channa punctatus* (Bloch)
212. *Channa striatus* (Bloch)

Order TETRAODONTIFORMES

Family TETRAODONTIDAE

213. *Tetraodon (Monotretus) travancoricus* (Hora & Nair)*

SYSTEMATIC ACCOUNT

1. ***Notopterus notopterus*** (Pallas)

1769. *Gymnotus notopterus* Pallas, *Spicil. Zool.,* **7** : 40, pl. 6, fig. 2 (type-locality :?Indian Ocean).

1991. *Notopterus notopterus,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. 1 : 64-65.

1999. *Notopterus notopterus,* Jayaram, *The Freshwater Fishes of The Indian Region* : 19-20.

Material Examined : 2 exs., 187-190 mm. SL., N.R. Pura, 20.6.02, F.6998, Coll. M.B. Raghunathan; 1 ex., 118 mm. SL., Bangalore Suburban, 12.3.02, F.6985, Coll. S. Krishnan.

Distribution : India.

Elsewhere : Myanmar. Bangladesh. Indonesia. Malaysia. Nepal. Pakistan. Thailand.

2. ***Salmophasia acinaces*** (Valenciennes)

1842. *Leuciscus acinaces* Valenciennes, *Hist. Nat. Poiss.*, **17**: 509 (type-locality : Kavery drainage, Mysore).

1991. *Salmostoma acinaces,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 321.

1998. *Salmophasia acinaces*, Kottelat, *J. South Asian nat. Hist.*, **3**(1) : 117-119.

Material Examined : 1 ex, Stream near Belthangdi, S.S. Kanble, 5.9.1991, 1 ex, Halady, S. Kanara, S.S. Kamble,12.9.1991. 2 exs., 47-48 mm. SL., Sigadala, Chikmagalur Dist., 27.3.03., F.7275., Coll., S. Krishnan; 4 exs., 13-48 mm. SL., Narsipura, Chikmagalur Dist., 28.3.03., F.7277., Coll. S. Krishnan ; 5 exs., 74-86 mm. SL., Harangi Reservoir, 8.9.98, F.5782, Coll. M.B. Raghunathan.

Distribution : India : Peninsular India : Western Ghats : Nilgiris and AnamalaisCauvery System; Mysore: Cauvery System and the Thungabhadra River.

3. ***Salmophasia boopis*** (Day)

1873. *Chela boopis* Day, *Proc. Zool. Soc. London,* 708 (Type locality : South canara)

1991. *Salmostoma boopis,* Talwar & Jhingran, *Inland Fishes of India and Adjacent Countries,* **1** : 322.

1998. *Salmophasia boopis*, Kottelat, *J. South Asian nat. Hist.*, **3**(1) : 117-119.

Material Examined : 1 ex, kota, S.S. Kanble, 15.9.1991, 3 exs, Kali river 4 km from Ganeshgudi supadam, R.M. Sharma, 15.9.1991, 1 ex, stream near Belthaugdi, S.S. Kanble, 5.9.1991, 1 ex, Tank near Netti dist, S. Kanard, S.S. Kanble, 8.9.1991; 8 exs., 53-66 mm.SL., Santhinagara, Chikmagalur Dist., 25.3.03., F.7322., Coll. S. Krishnan; 14 exs., 60-70 mm. SL., Nagalapura, Chikmagalur Dist., 27.3.03., F.7331., Coll. S.Krishnan ; 2 exs., 113-125 mm. SL., Harangi Reservoir, 8.9.98, Coll. M.B. Raghunathan; 1 ex., Yennehole, Sharavathi River, 17.7. 2004, F.8073, Coll. Sreekantha.

Distribution : Peninsular India, W.ghats, Maharashtra, Karnataka, South Canara District.

4. ***Salmophasia clupeoides*** (Bloch)

1782. *Cyprinus clupeoides* Bloch, *Naturges ausland. Fische,* **12** : 49, pl. 408, fig. 2 (type- locality: "Indian Ocean", evidently not the ocean but some fresh water).

1991. *Salmostoma clupeoides*, Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 323.

1998. *Salmophasia clupeoides*, Kottelat, *J. South Asian nat. Hist.*, **3**(1) : 117-119.

Material Examined : 2 exs., 114-117 mm. SL., Uruganthottai, Bannerghatta N.P., 19.3.04, F.7370, Coll. M. Rema Devi; 1 ex., 108 mm. SL., Kondanjji, Davengere Dist., 18.9.2007, F.8105, Coll.S. Prabakaran; 3 exs., 20-54 mm.SL., Kondanjji, Davengre Dist., 17.9.07, F.8141, Coll. S. Prabakaran.

Distribution : India : Peninsular India: Gujarat, Maharashtra, Karnataka, Tamil Nadu and Madhya Pradesh (Cauvery, Godavary, Krishna, Narmada and Tapti River Systems).

5. ***Barilius bakeri*** Day

1865. *Barilius bakeri* Day, *Proc. Zool. Soc. London* : 305 (Type locality: Mundayakam, Kerala).

1991. *Barilius bakeri,* Talwar & Jhingran, *Inland Fishes of India and Adjacent* Countries, **1** : 343.

1999. *Barilius bakeri,* Jayaram, *The Freshwater Fishes of The Indian Region* : 19-69.

Material Examined : 4 exs., 59-85 mm. SL., Harangi Resrvoir, 8.9.98, F.5785, Coll. M.B. Raghunathan; 1 ex., 80 mm. SL., Honagodu, 18.6.02, F.7005, Coll. M.B. Raghunathan.

Distribution : Peninsular India, W. Ghats, Kerala and Karnataka.

6. ***Barilius barna*** Hamilton

1822. *Cyprinus (Bailius) barna* Hamilton, *Fishes of Ganges*: 268, 384 (Type locality: Yamuna River and Brahmaputra River)

1991. *Barilius barna,* Talwar & Jhingran, *Inland Fishes of India and Adjacent Countries*, **1** : 344-345.

Material Examined : 1 ex., 33 mm. SL., Sigadala, 27.3.03, F.7276, Coll. S. Krishnan.

Remarks : This is the first report of the species from Southern India from the Cauvery River in Karnataka.

Distribution : India : Ganga and Brahmaputra River systems, Mahanadi (Orissa) and also Cauvery River. Nepal. Bangladesh. Burma.

7. ***Barilius canarensis*** (Jerdon)

1849. *Opsarius canarensis* Jerdon, *Madras. J. Lit. & Sci.,* **15** : 329 (Type locality : Canara).

1991. *Barilius canarensis,* Talwar & Jhingran, *Inland Fishes of India and Adjacent Countries*, **1** : 347.

1999. *Barilius bendelisis,* Jayaram, *The Freshwater Fishes of The Indian Region* : 70-71.

Material Examined : 16 exs., 45-95 mm. SL., Gundia River, Nov. 2003, F.7629, Coll. M.S. Ravichandran.

Distribution : Peninsular India, W.ghats, Krishna and Tungabhadra River Systems.

8. ***Barilius gatensis*** (Valenciennes)

1844. *Leuciscus gatensis* Valenciennes, *Hist. nat. Poiss.,* **17** : 309, pl. 503 (type-locality : Peninsula of India).

1991. *Barilius gatensis,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 349.

1999. *Barilius gatensis,* Jayaram, *The Freshwater Fishes of the Indian Region* : 70-72.

Material Examined : 5 exs., 25-28 mm. SL., Jannapura, 15.6.02, Coll. M.B. Raghunathan; 1 ex., 46 mm. SL., Malanallasandra, 10.12.05, F.7854, Coll. S. Prabakaran; 3 exs., 33-40 mm. SL., Krishnarajasagar, 16.12.05, F.7914, Coll. S. Prababkaran; 1 ex., 22 mm. SL., Balichathru Thodu, 22.11.03, F.7953, Coll. S. Krishnan; 2 exs., 24-25 mm.SL., Thalakavery, 15.11.03, F.7956, Coll. S. Prabakaran; 1 ex., 57 mm. SL., Abyothmangala, 15.9.06, F.7967, Coll. S. Prabakaran.

Distribution : India : W. Ghats.

9. ***Laubuca laubuca*** (Hamilton)

1822. *Cyprinus (Chela) laubuca* Hamilton, *Fishes of Ganges* : 260, 384 (Type locality : Ponds in Northern parts of Bengal)

1991. *Chela laubuca*, Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 316-317.

1999. *Chela laubuca,* Jayaram, *The Freshwater Fishes of The Indian Region* : 73-74.

Material Examined : 6 exs., 31-49 mm. SL., kapila Nandi near Nanjangud, 3.4.2000, F.6860, Coll. S.Krishnan; 3 exs., 42-46 mm. SL., Kapila Nandhi River, Nanjangud, 3.4.2000, F.6860, Coll. S. Krishnan; 1 ex., 41 mm. SL., Mysore, Apr, 2000, Coll S. Krishnan.

Distribution : India.

Elsewhere : Bangladesh. Paksistan. Sri Lanka. Myanmar. Malay Peninsula and Sumatra.

10. ***Esomus barbatus*** (Jerdon)

1849. *Leucisscus barbatus* Jerdon, *Madras J. Lit.Sci,* **15** : 322 (Type locality : Bowany river, South India)

1991. *Esomus barbatus,* Talwar & Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 376.

1999. *Esomus barbatus,* Jayaram, *The Freshwater Fishes of The Indian Region* : 75.

Material Examined : 2 exs, Appayya kunta, chikkaballapur, dist. Kolar, M.B. Rao,17.3.78, 50 exs, Srinivasapur tank, Srinivasapur,dist. Kolar, M.B. Rao, 14.3.1978, 10 exs, Gavana tank, Siddalghata,Chintamani, dist. Kolar, M.B.Rao, 15.3.1978, 1 ex, Abdul Ali Garden ; 5 exs., 59-64 mm.SL., Muninagara, 22,3.04, F.7416, Coll.K. Rema Devi.

Distribution : India : Tamil Nadu, Karanataka

11. ***Esomus danricus*** (Hamilton)

1822. *Cyprinus danrica* Hamilton, *Fish. Ganges* : 325, 390, P1.16, fig. 88, (Type locality : ponds & ditches of Bengal).

1991. *Esomus danricus,* Talwar & Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 371-372.

1999. *Esomus danricus*, Menon, Checklist–fresh water fishes of India. *Rec. zool. surv. India, Misc. Publ. Occ. Paper,* **175** : 46-48.

Material Examined : 3 exs Vijayapura tank, kolar, M.B. Rao, 19.3.78, 6 exs,srinivasapur tank, srinivasapura, dist. Kolar, M.B. Rao, 14.3.1978, 8 exs, Belgaun dist. Mysore, B.K. Tikader, 11.2.1965; 12 exs., 40-60 mm.SL., Mullaghatta Highway, Kolar Dist., 22.3.02, F.6915, Coll. S. Krishnan; 14 exs., 37-44 mm. SL., Kambinahalli, 24.3.02, F.6921, Coll. S. Krishnan; 1 ex., 38 mm.SL., Kombalagodu, Bangalore, 14.3.02, F.6972, Coll. S. Krishnan; 5 exs., 32-37 mm. SL., Kolar-Mulbagal High Way, 22.3.02, F.6975, Coll. S. Krishnan; 8 ex., 32-33 mm. SL., Seenapanthotti, 20.12.05, F.7841, Coll. S. Prabakaran;

Distribution : India : Throughout Northern India. Now also common in Southern India.

Elsewhere : Pakistan. Nepal. Sri Lanka. Burma.

12. ***Esomus thermoicos*** (Valenciennes)

1842. *Nuria thermoicos* Valenciennes, *Hist. nat. Poiss.,* **16** : 238, pl. 472 (type-locality: hot springs at Kanniya, Sri Lanka).

1991. *Esomus thermoicos,* Talwar & Jhingran, *Inland fishes of India and Adjacent Countries,*Vol. **1** : 378-379.

1999. *Esomus thermoicos,* Jayaram *The Freshwater Fishes of The Indian Region* : 75.

Material Examined : 1 ex., 57 mm. SL., Mysore, April, 2000, Coll. S. Krishnan; 1 ex., 29 mm. SL., Bangalore, 28.12.01, Coll. M.B. Raghunathan; 7 exs., 28-33 mm. SL., Amerahalli Kere, 20.12.01, F.6872, Coll. M.B. Raghunathan; 2 exs., 30-39 mm. SL., Yelhanka, 17.12.01, F.6876, Coll. M.B. Raghunathan; 47 exs., 47-70 mm. SL., BEML Township, Outer, 22.3.02, F.6903, F.6917, Coll. S. Krishnan; 3 exs., 41-42 mm SL., Jangamkote, 24.3.02, F.6949, Coll. S. Krishnan; 1 ex., 38 mm.SL., Kanva Reservoir, 16.3.02, Coll. S. Krishnan; 2 exs., 27-30 mm.SL., Arabikothanur, Kolar Dist., 15.3.02, Coll. S. Krishnan; 1 ex., 44 mm. SL., Thattekere, Bannerghatta N.P., 18.3.03, F.7288, Coll. S. Krishnan; 1 ex., 33 mm. SL., Chickrahalli, 16.3.03, F.7309Coll. S. Krishnan; 2 exs., 29-33 mm. SL., Palankuppai Valla, 17.9.03, F.7348, Coll. G. Thirumalai; 4 exs., 62-72 mm. SL., Uthigabande,, 18.3.04, F.7361, Coll. K.Rema Devi; 6 exs., 68-84 mm. SL., Uruganthottai, 19.3.04, F.7371, Coll. K. Rema Devi; 25 exs., 40-75 mm. SL., Uthigabandi, 18.3.04, F.7388, Coll. K. Rema Devi; 1 ex., 55 mm. SL., Uchanakunte, 18.3.04, F.7402, Coll. K. Rema Devi; 5 exs., 34-35 mm. SL., Poodhipadiga, Chamrajnagar Dist., 20.12.05, F.7878, Coll. S. Prabakaran; 7 exs., 23-27 mm.SL., Gabbadi Kere, Bangalore, 11.12.05, Coll. S. Prabakaran.

Distribution : India: Southern India.

Elsewhere : Sri Lanka.

13. ***Devario aequipinnatus*** (McClelland)

1839. *Perilampus aequipinnatus* McClelland, *Asiat. Res.,* **19**(2): 393, pl.60, fig. 1. (Type locality: Assam).

1999. *Danio aequipinnatus,* Jayaram, *The Freshwater Fishes of The Indian Region*: 75.

2003. *Devario,* Fang Fang, *Copeia* (4) : 714-728.

Material Examined : 4 exs, kapinadka Bridge on Dharmasthal Karkalla Road, P.P. Kulkarni, 12.2.1992, 3 exs, Uppinangdi, S.S. Kanble, 4.9.1991, 1 ex, Sulkeri river 12 km from Karkalla on Belthangady Road, P.P. Kulkarni, 17.2.1992, 5 exs Bombar belt 21 kms. From Karkal, P.P. Kulkarni, 18.2.1992, 9 exs, Kupetti river, Tal. Belthangady, P.P. Kulkarni, 11.2.1992, 9 exs, Badaga kavandur, S.S. Kanble,10.9.1991, 1ex, Nalla near panja village, Tal. Sullia, P.P. Kulkarni, 8.2.1992, 5 exs, Stream near Belthangdi, S.S. Kanble, 5.9.1991, 2 exs, Jolsur,sou47-48 mm. SL., S. Kanara, S.S. Kanble, 1.9.1991, 3 exs Kalin river near Erde village puttur, S.kavara, P.P. Kulkarni, 9.2.1992, 14 exs, yenna hulli, S. kanara, S.S. Kanble, 7.9.1991, 1 ex, Subramaniyam, S. Kanara, S.S. Kanble, 12.9.1991, 1 ex, tank near Nette, dist. S. Kanara, S.S. Kanble, 8.9.1991;11 exs., 41-58 mm. SL., Mysore., April, 2000., Coll. S. Krishnan; 16 exs., 43-58 mm. SL., Mysore., April, 2000., Coll. S. Krishnan; 36 exs., 20-57 mm. SL., Mysore, April, 2000., Coll. S. Krishnan; 7 exs., 32-47 mm. SL., Mysore, April, 2000., Coll. S. Krishnan; 24 exs., 32-47 mm. SL., Mysore, April, 2000., Coll. S. Krishnan; 24 exs., 35-60 mm. Sl., Mysore, April, 2000., Coll. S. Krishnan; 23 exs., 38-48 mm. Sl., Mysore, April, 2000., Coll. S. Krishnan.5 exs., 27-45 mm. SL., Kanathy, Chikmagalur Dist., 16.6.02, F.7004., Coll. M.B. Raghunathan; 12 exs., 29-55 mm. SL., Honagodu, Chikmagalur Dist., 18.6.02., F.7007., Coll. M.B. Raghunathan ; 1 ex., 49 mm. SL., Bangalore, 28.12.01, F.6864, Coll. M.B. Raghunathan; 12 exs., 18-34 mm. SL., Thalasahalli, Srirangapattinam, 14.12.05, F. 7863, Coll. S. Prabakaran.

Distribution : India.

Elsewhere : Nepal. ? Sri Lanka. Bangladesh. Myanmar and Thailand.

14. ***Devario malabaricus*** (Jerdon)

1849. *Perilampus malabaricus* Jerdon, *Madras J. Lit. and Sci., **15** : 325. (type-locality*: Malabar).

1991. *Danio malabaricus,* Talwar and Jhingran, *Inland Fishes of India and AdjacentCountries,* Vol. **1** : 370-371.

2003. *Devario malabaricus,* Fang Fang, *Copeia,* (4) : 714-728.

Material Examined : Puthur; 17.9.98, F.5777, Coll. M.B.Raghunathan; 17 exs., 40-63 mm. SL., Shanthi Nagara, 25.03.03, F.7323, Coll. S. Krishnan; 4 exs., 36-45 mm. SL., Gulganjamana, 26.3.03, F.7325 47 exs., 25-59 mm. SL, Coll. S. Krishnan; 7 exs., 35-45 mm. SL., Nimmar, 26.3.03, F.7327, Coll. S.Krishnan; 3 exs., 42-47 mm. SL., Korakanahalli, 26.3.03, F.7333, Coll. S. Krishnan; 5 exs., 30-47 mm. SL., Road to Hassan Dist. Javagal, 30.3.01, F.6788, Coll. G. Thirumalai; 91 exs., 40-60 mmSL., Road to Mandya, 8.4.01, F.6799, Coll. G. Thirumalai; 32 exs., 21-55 mm. SL., Road to Hassan, Karkuntha, 30.3.01, F.6819, Coll. G. Thirumalai. 69 exs., 40-60 mm. SL., Road t, Javagal, 30.3.01, F.6788, Coll. G. Thirumalai; 5 exs., 41-60 mm. SL., Uruganadoddi, Bannerghatta N.P., 18.3.03, F.7307, Coll. S. Krishnan; 24 exs., 25-55 mm. SL., Muthyala maduvu, Bannerghatta N.P., 15.9.03, F.7349, Coll. G.Thirumalai; 1 ex., 65 mm.SL., Muthyala Maduvu, Bannerghatta N.P. 20.3.04, F.7408, Coll. K. Rema Devi; 18 exs., 22-48 mm. SL., Palahalli, Srirangapattinam, 14.12.05, F.7835, Coll. S.prabakaran; 54 exs., 21-51 mm. SL., Ramasany Canal, Mysore Dist., 17.12.05, F.7852, Coll. S. Prabakaran; 1 ex., 18 mm. SL., Poodhipadiga, Chamarajnagar Dist., 20.12.05, Coll. S. Prabakaran; 10 exs., 20-30 mm. SL., Appangaro, medikere, Kodagu, 23. 12. 05, F.7881, Coll. S. Prabakaran; 1 ex., 23 mm.SL., Kabini River, Nanjangud, 15.12.05, F.7894, Coll. S. Prabakaran; 168 exs., 16-52 mm. SL., Balakola Canal, Mysore Dist., 16.12.05, F.7902, Coll. S. Prabakaran; 265 exs., 20-50 mm. SL., Krishnarajasagar, 16.12.05, F.7912, Coll. S. Prabakaran; 1 ex., 32 mm. SL., Pettikere, medikere, 23.12.05, F.7930, Coll. S. Prabakaran; 5 exs., 27-50 mm. SL., Near Zoo, Mysore Dist., 18.12.05, F.7943, Coll. S. Prabakaran; 1 e4x., 25 mm.SL., Bhagamandala, Coorg Dist., 13.9.06, F.7974, Coll. S. Prabakara; 7 exs., 20-31 mm. SL., Thalakavery, 13.9.06, F.7983, Coll. S. Prabakaran.

Distribution : India: Krishna River Basin and Throughout Western Ghats.

Elsewhere : Sri Lanka.

15. ***Brachydanio rerio*** (Hamilton)

1822. *Cyprinus rerio* Hamilton, *Fish of Ganges*: 323, 390. (Type-locality: Kosi River, Uttar Pradesh).

1991. *Brachydanio rerio,* Talwar and Jhingran, *Inland Fishes of India and AdjacentCountries,* Vol. **1** : 360.

2003. *Devario rerio,* Fang Fang, *Copeia,* (4): 714-728.

Material Examined : 3 exs, Sagar dist. Shimoga, Mysore, B.K .Tikader, 10.3.1965, 5 exs, Sirsi, dist. N. Kanard, Mysore, B.K. Tikader, 28.2.1965, 11 exs, stream near Bijali village, Mudigurd, Chikmagalur, Mysore, B.K. Tikader, 20.1.1964; 26 exs., 17-24 mm. SL., Jannapura, Chikmagalur Dist., 15.6.02, F.7002, Coll M.B. Raghunathan; 1 ex., 27 mm. SL., Honagodu, 18.6.02, F.7008 , Coll. M.B. Raghunathan; 8 exs., 24-27 mm. SL., Sringeri, Agumbe Road, 19.6.02, F.7014 , Coll. M.B. Raghunathan; 2 exs., 23-26 mmSL., Bhagamandala, Coorg Dist., 13.9.06, F.7978, Coll. S. Prabakaran; 4 exs., 15-17 mm. SL., Thalakavery, Coorg Dist., 13.9.06, F.7985, COll. S. Prabakaran; 54 exs., 15-26 mm.SL., Medikere, Kodagu, 23.12.05, F.7883, Coll. S. Prabakaran ; 41 exs., 125 mm. SL., Medikere, Pettikere, 23.12.05, F.7929, Coll. S. Prabakaran.

Distribution : Throughout India.

Elsewhere : Pakistan. Bangladesh. Nepal. Widespread elsewhere.

16. ***Rasbora caverii*** (Jerdon)

1849. *Leucisus caverii* Jerdon, *Madras J. Sci .& Lit,* **15** : 320 (Type-locality: Cauvery River (Karnataka).

1991. *Rasbora caverii,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 388-389.

1999. *Rasbora caverii,* Jayaram, *The Freshwater Fishes of The Indian Region*: 82-83.

Material Examined : 1 ex, Yenna hulli, S. Kanara, S.S. Kamble, 7.9.1991. 54 exs., 26-72 mm. SL., Melkoto W.L.S. Bevugal R. F., Mandya Dist., 10.4.2001, F.6777, Coll. G. Thirumalai; 106 exs., 17-52 mm S L., Road to Behur, Bhomihalla., Hassan Dist., 31.3.01., F.6810., Coll. G. Thurumalai; 54 exs., 23-69 mm S.L., Road to Hassan to Patna., 3.4.01., F.6812., Coll. G Thirumalai; 153 exs., 23-102 mm S.L., Road to Hassan, Kaskuntha., 30.3.01., F. 6818, F.6825, F. 6827., Coll. G. Thirumalai; 3exs., 45-110 mm S.L., Vastara, Chikmagalur Dist., 21.3.03., F. 7315., Coll. S. Krishnan; 3 exs., 64-72 mm. SL., Harangi Reservoir, 8.9.98, F.5784, Coll. M.B. Raghunathan; 1 ex., 64 mm.SL., Thanganhalli, Tumkur Dist., 23.9.07, F.8083, Coll. S. Prabakaran; 1 ex., 33 mm.SL., Basavanathahalli, 13.12.01, Coll. M.B. Raghunathan; 28 exs., 25-51 mm. Sl., Amerahalli Kere, Kolar Dist., 12.12.01, F.6873, Coll. M.B. Raghunathan; 2 exs., 24-32 mm. SL., Yelhanka, 17.12.01, F.6879, Coll. M.B. Raghunathan; 9 exs., 17-28 mm. SL., Mallasandra Kere, 21.12.01, Coll. M.B. Raghunathan; 41 exs., 28-52 mm. SL., Uyyampalli, 17.3.02, F.6891, Coll. S. Krishnan; 36 exs., 17-91 mm. SL., BEML, Township, 22.3.02, F.6907, Coll. S. Krishnan; 2 exs., 25-26 mm.SL., Bage palli, 28.3.02, Coll. S. Krishnan; 21 exs., 65-109 mm. SL., BEML Township, Outer Tank, 22.3.02, F.6919, Coll. S. Krishnan; 350 exs., 17-35 mm. SL., Holasahalli, 19.3.02, F.6929, Coll. S. Krishnan; 41 exs., 25-51 mm. SL., Magadi Tank, 18.3.02, F.6936, Coll. S. Krishnan; 236 exs., 17-80 mm. SL., Narasapura, Kolar Dist., 15.3.02, F.6967, Coll. S. Krishnan; 58 exs., 17-31 mm. SL., Arabikothanur, Kolar Dist., 15.3.02, F.6971, Coll. S. Krishnan; 10 exs., 21-26.5 mm. SL., Kombalagodu, Bangalore, 14.3.02, F.6973, Coll. Material examined :- 1 ex, Yenna hulli, S. Lanara, S.S. Kanble, 7.9.1991. 54 exs., 26-72mm. SL.,Melkoto W.L.S. Bevugal R . F., Mandya Dist., 10.4.2001,F.6777, Coll. G. Thirumalai; 106 exs., 17-52 mm S L., Road to Behur, Bhomihalla., Hassan Dist., 31.3.01., F.6810., Coll. G. Thurumalai; 54 exs., 23-69 mm S.L., Road to Hassan to Patna., 3.4.01., F 6812., Coll. G Thirumalai; 153 exs., 23-102 mmS.L., Road to Hassan, Kaskuntha., 30.3.01., F. 6818, F.6825, F.6827., Coll. G. Thirumalai; 3exs., 45-110 mm S.L.., Vastara, Chikmagalur Dist., 21.3.03., F. 7315., Coll. S. Krishnan; 3 exs., 64-72 mm. SL., Harangi Reservoir, 8.9.98, F.5784, Coll. M.B. Raghunathan; 1 ex., 64 mm. SL., Thanganhalli, Tumkur Dist., 23.9.07, F. 8083, Coll. S. Prabakaran; 1ex., 33 mm.SL., Basavanathahalli, 13.12.01, Coll. M.B.

Raghunathan; 28 exs., 25-51 mm. Sl., Amerahalli Kere, Kolar Dist., 12.12.01, F.6873, Coll. M.B. Raghunathan; 2 exs., 24-32 mm.SL., Yelhanka, 17.12.01, F.6879, Coll. M.B. Raghunathan; 9 exs., 17-28 mm. SL., Mallasandra Kere, 21.12.01, Coll. M.B. Raghunathan; 41 exs., 28-52 mm.SL., Uyyampalli, 17.3.02, F.6891, Coll. S. Krishnan; 36 exs., 17-91 mm.SL., BEML, Township, 22.3.02, F.6907, Coll. S. Krishnan; 2 exs., 25-26 mm. SL., Bage palli, 28.3.02, Coll. S. Krishnan; 21 exs., 65-109 mm. SL., BEML Township, Outer Tank, 22.3.02, F.6919, Coll. S. Krishnan; 350 exs., 17-35 mm. SL., Holasahalli, 19.3.02, F.6929, Coll. S. Krishnan; 41 exs., 25-51 mm. SL., Magadi Tank, 18.3.02, F.6936, Coll. S. Krishnan; 236 exs., 17-80 mm. SL., Narasapura, Kolar Dist., 15.3.02, F.6967, Coll. S. Krishnan; 58 exs., 17-31 mm.SL., Arabikothanur, Kolar Dist., 15.3.02, F.6971, Coll. S. Krishnan; 10 exs., 21-26.5 mm.SL., Kombalagodu, Bangalore, 14.3.02, F.6973, Coll S. Krishnan ; 4 exs., 43-46 mm. SL., Mooleygundi, Bannerghatta N.P., 15.3.03, F.7282, Coll. S. Krishnan; 1 ex., 69 mm.SL., S. Krishnan; 2 Uruganthoddi, Bannerghatta N.P., 18.3.03, F.7306, Coll. S. Krishnan; 23 exs., 20-55 mm. SL., Doddannakere, Bannerghatta N.P., 15.3.04, F.7355, Coll. K. Rema Devi ; 3 exs., 65-82 mm. SL.,Uthigabande Gate, 18.3.04, F.7362, Coll. K. Rema devi; 1 ex., 118 mm. SL., Uruganthottai, 19.3.04, F.7372, Coll. K. Rema Devi; 16 exs., 20-55 mm.SL., Uthigabande, 18.3.04, F.7389, Coll. K. Rema devi; 1 ex., 23 mm. SL., Muthiyala Maduvu, 20.3.04, F.7409, Coll. K. Rema Devi; 15 exs., 20-50 mm. SL., Muninagaram, 22.3.04, F.7415, Coll. K. Rema Devi; 2 exs., 37-40 mm. SL., Poodhipadiga,20.12.05, F.7880, Coll. S. Prabakaran; 7 exs., 32-80 mm. SL., Bantanalu, 23.3.04, F.7392, Coll. K. Rema Devi.

Distribution : India : Southern India, Notably Karnataka, especially the Cauvery Basin, Javadi Hills, Eastern Ghats.

Elsewhere : Sri Lanka.

17. ***Rasbora daniconius*** (Hamilton)

1822. *Cyprinus daniconius* Hamilton-Buchanan, *Fishes of Ganges*: 327, 391, pl. 15, Fig. 89 (Type-locality : rivers of southern Bengal).

1991. *Parluciosoma daniconius,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 382-383.

1999. *Rasbora daniconius*, Jayaram, *The Freshwater Fishes of The Indian Region*: 82-83.

Material Examined : 5 exs, Kapinadka Bridge on Dharmasthal-Karkalla Road, P.P. Kulkarni, 12.2.1992, 2 exs Sulkeri river 12 km. from Karkalla on Belthangady Road, P.P.Kulkarni, 17.2.1992, 2 exs, Bombar bett 21 kms. From Karkal, P.P. Kulkarni, 18.2.1992, 2 exs, Dharamsthala, S.S. Kanble, 5.9.1991, 3 exs, Kupetti river, Tal. Belthangady, P.P. Kulkarni, 3 exs, Kupetti river, Tal. Belthangady, P.P. Kulkarni, 11.2.1992, 12 exs, Appaya kunta, Chikkabalapur, dist. Kolar, M.B. Rao, 17.3.1978, 1 ex, Nalebh near murlia village, Tal. Sullia, P.P. Kulkarni, 7.2.1992, 10 exs, Jolsur, south kanara, S.S. Kanble, 1.9.1991, 5 exs, Kali river near Erde village puttur, s.kanara, P.P. Kulkarni, 9.2.1992, 6 exs Halady, s.kanara, S.S. Kanble, 12.9.1991, 14 exs, Mashid Basalguntha pond, Mulbagal, Dist. Kolar, M.B. Rao, 8.3.1978, 24 exs, Srinivasapur tank, srinivasapur, dist. Kolar, M.B. Rao, 14.3.1978, 3 exs, Tank near Nette, dist. S.kanara, S.S. Kanble, 8.9.1991, 4 exs, Gavana tank, Siddalghata, chintaniuni, dist. Kolar, M.B. Rao, 15.3.1978, 60 exs, Srinivasapur tank, srinivasapur, dist. Kolar, M.B. Rao, 14.3.1978, 5 exs Bada Talab, Mullagal, dist. Kolar, M.B. Rao, 9.3.1978; 27 exs., 33-93 mm. SL., Mysore, April 2000, Coll. S. Krishnan; 5 exs., 30-47 mm. SL., Road to Hassan District., Javagal., 30.3.01., F.6787., Coll. G.Thirumalai; 47 exs., 26-70 mm. SL., Bhandur, Hassan District., 30.3.01., F.6797., Coll. G. Thirumalai; 15 exs., 37-87 mm. SL., Road to Mandya., 8.4.01., F.6800., Colll. G. Thirumalai; 50 exs., 18-43 mm. SL., Road to Hassan to Patna., 3.4.01., F.6813., Coll. G. Thirumalai; 205 exs., 27-71 mm. SL., Hassan to Kalkere., 24.4.01., F.6832, Coll. G. Thirumalai; 24 exs., 28-78 mm. SL., Melkoto W.L.S., Bevugal R.F., Mandya Dist., 10.4.01, F.6778, Coll. G. Thirumalai; 6 exs., 29-47 mm.SL., Honagodu, Chikmagalur Dist., 18.6.02, F.7006, Coll. M.B. Raghunathan; 59 exs., 28-76 mm. SL., Sringeri, Hugumbe Road, 19.6.02, F.7013, Coll. M.B.Rahunathan; 3 exs., 34-50 mm. SL., Bhadra,

Sankakar Gutta, 21.6.02, F.7023, Coll. M.B. Raghunathan; 20 exs., 22-31 mm. SL., Near Village Road, Chikmagalur Dist., 27.6.02, F.7027, Coll. M.B. Raghunathan; 2 exs., 18.5-40 mm. SL., Kadur, 25.6.02, F.7029, Coll. M.B. Raghunathan;1 ex., 42 mm.SL., Sigadala, 27.3.03, F.7274, Coll. S. Krishnan; 1 ex., 20 mm. SL., Narsipura, 28.3.03, F.7278, Coll. S. Krishnan; 1 ex., 23 mm.SL., Shanthi Nagara, 25.3.03, F.7324, Coll. S. Krishnan; 6 exs., 38-53 mm. SL., Gulganjamana, 26.3.03, F.7326, Coll. S. Krishnan; 3 exs., 40-47 mm. SL., Nimmar, 26.3.03, F.7328, Coll. S. Krishnan; 1 exs., 46 mm.SL.,Nagalapura, 27.3.03, F.7332, Coll. S. Krishnan; 5 exs., 45-51 mm. SL., Korakkanahalli, 26.3.03, F.7334, Coll. S. Krishnan; 47 exs., 25-59 mm. SL., Puthur, 17.9.98, F.5777, Coll. M.B. Raghunathan; 2 exs., 64-73 mm. SL., Harangi Reservoir, 8.9.98, F.5783, Coll. M.B. Raghunathan; 5 exs., 29-76 mm.SL., Puthur, 17.9.98, F.5778, COll. M.B. Raghunathan; 2 exs., 16-20 mm. SL., Beerandahalli, Kolar Dist, 28.9.07, F.8088, Coll. S. Prabakaran; 6 exs., 44-65 mm. SL., Ramasagar, Kolar Dist., 27.9.07, F.8093, Coll. S. Prabakaran; 7 exs., 25-46 mm.SL., Hallayella, Haveri Dist., 13.9.07, F.8116, Coll. S. Prabakaran; 31 exs., 25-40 mm.SL., Bangalore, 28.12.01, F. 6865, Coll. M.B. Raghunathan; 26 exs., 25-54 mm. SL., Magadi Tank, Bangalore, 18.3.02, F.6935, Coll. S.Krishnan; 1 ex., 23 mm.SL., Chintamani, Coll. S. Krishnan; 4 exs., 27-33 mm SL., Kanva Rservoir, 16.3.02, Coll. S. Krishnan; 1 ex., 52 mm. SL., Palankuppai Valla, Bannerghatta N.P., 17.9.03, F.7347, Coll. G. Thirumalai; 1 ex., 45 mm.SL., Hosekere New Tank, Bantanalu, Bannerghatta N.P., 23.3.04, F.7382, Coll. K. Rema Devi; 1 ex., 22 mm.SL., Beethahalli Kavalu, 23.3.04, Coll. K. Rema Devi; 1 ex., 32 mm.SL., Palahalli, Srirangapattinam, 14.12.05, F.7836, Coll. S.Prabakaran; 4 exs., 31-44 mm.SL., Seenapanthotti (Attolipura), Chamaraj Nagar Dist., 20.12.05, F.7842, Coll. S. Prabakaran; 1 ex., 46 mm.SL., Ramasany Canal, Mysore Dist., 17.12.05, F.7853, Coll. S. Prabakaran; 5 exs., 22-30 mm. SL., Thalasahalli, Srirangapattinam, 14.12.05, F.7866, Coll. S. Prabakaran; 3 exs., 18-60 mm. SL., Nanjangud, 15.12.05, F.7869, Coll. S.Prabakaran; 2 exs., 30-38 mm.SL., Poodhipadiga, Chamarajnagar Dist., 20.12.05, F.7879, Coll. S. Prabakaran; 4 exs., 31-42 mm.SL., Appangaro, Medikere, Kodagu Dist., 23.12.05, F.7884, Coll. S. Prabakaran; 3 exs., 18-25 mm.SL., Kabani River, Nanjangudi, Mysore Dist., 15.12.05, F.7891, Coll. S. Prabakaran; 32 exs., 25-73 mm SL., Balakola Canal, Mysore Dist., 16.12.05, F.7903, Coll. S. Prabakaran; 37 exs., 17-73 mm. SL., Krishnarajasagar, 16.12.05, F.7913, Coll. S. Prabakaran; 4 exs., 28-36 mm.SL., Pettikere, Medikere, 23.12.05, F.7931, Coll. S. Prabakaran; 9 exs., 27-36 mm.SL., Gevenaballi, Hassan Dist., 28.12.05, F.7935, Coll. S. Prabakaran; 1 ex., 26 mm. SL., Thimmanahalli, Hassan Dist., 28.12.05, Coll. S. Prabakaran; 1 ex., 59 mm.SL., Near Zoo, Mysore Dist., 18.12.05, F.7942, Coll. S. Prabakaran; 6 exs., 16-27 mm.SL., Puttulu, Kaniyur, Dakshin Kannada, 19.11.03, F.7950, Coll. M.S. Ravichandran; 1 ex., 18 mm.SL., Addayar, Mangalore Dist., 18.9.06, Coll. S. Prabakaran; 2 exs., 28-30 mm. SL., 13.9.06, F.7973, Coll. S.Prabakaran; 11 exs., 29-60 mm. SL., Medikere, Chittahalli, 24.12.05, F.7898, Coll. S.Prabakaran; 5 exs., Sharavathy River, 2.5.02, F.8044, Coll. Sreekantha *et al.*

Distribution : Throughout India.

Elsewhere : Bangladesh. Thailand. Myanmar. Nepal. Pakistan. Sri Lanka.

18. ***Rasbora labiosa*** Mukerji

1935. *Rasbora labiosa* Mukerji, *Rec. Indian Mus.*, **37** (3): 376, figs 1,2 (Type locality: Deolali, Nadik district. Maharashtra).

1991. *Parluciosoma labiosa,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 383.

1999. *Rasbora labiosa,* Jayaram, *The Freshwater Fishes of The Indian Region*: 83.

Material Examined : 108 exs., 34-54 mm.SL., Uyyampalli, 17.3.02, F.6942, Coll. S. Krishnan; 1 ex., 50 mm.Sl., Magdi Tank, 18.3.02, F.6937, Coll. S.K. Krishnan; 13 exs., 27-72 mm. SL., Jodithimmapura, 22.3.03, F.7258, Coll. S. Krishnan; 1 ex., 24 mm.,SL., Narsipura, 28.3.03, Coll. S. Krishnan; 1 ex., 43 mm. SL., Mysore, April, 2000, Coll S. Krishnan; 30 exs., 21.5-66

mm.SL., Vastara, 21.3.03, F.7316, Coll. S. Krishnan.

Distribution : India : Nasik Dist., Maharashtra, Karnataka.

Remarks : It is a new record.

19. ***Rasbora rasbora*** (Ham-Buch)

1822. *Cyprinus rasbora* Hamilton, *Fishes of Ganges* : 329, 391, P1.2, fig. 90 (Type-locality : Ponds of Bengal).

1999. *Rasbora rasbora*, Menon, Checklist –fresh water fishes of India. *Rec. zool. surv. India, Misc. Publ. Occ. Paper,* **175** : 53-54.

Material Examined : 1 ex, Uppinangdi, S.S. Kanble, 4.9.1991, 2exs, Halady, S. Kanara, S.S. Kanble, 12.9.1991.

Distribution : India : West Bengal and Assam.

Remarks : It is a new record.

20. ***Amblypharyngodon microlepis*** (Bleeker)

1853. *Leuciscus microlepis* Bleeker, *Verh. batav. Genoot. Kunst. Wet.,* **25** : 141. (Type-locality : Bengal).

1991. *Amblypharyngodon microlepis,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 337-338.

1999. *Amblypharyngodon microlepis,* Jayaram. *The Freshwater Fishes of The Indian Region* : 86.

Material Examined : 37 exs., 38-74 mm. SL., Uyyampalli, 17.3.02, F.6890, F.6941, Coll. S. Krishnan; 11 exs., 36-59 mm.SL., BEML Township Outer, 22.3.02, F.6904, Coll. S. Krishnan; 3 exs., 28-33 mm SL., Holasahalli, 19.3.02, F.6930, Coll. S. Krishnan; 19 + 3 (Juv.) exs., 19-63 mm.SL., Muninagaram, Bannerghatta N.P.,22.3.04, F.7414, Coll. K. Rema Devi..

Distribution : India: Bengal through Chota Nagpur to Peninsular India, except the west face of the Western Ghats.

21. ***Amblypharyngodon mola*** (Hamilton)

1822. *Cyprinus mola* Hamilton, Fishes of Ganges: 334, 392, pl. 38, fig. 92. (Type locality: ponds and rivers of Gangetic Provinces).

1991. *Amblypharyngodon mola,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 338.

1999. *Amblypharyngodon mola,* Jayaram. *The Freshwater Fishes of The Indian Region* : 86-87.

Material Examined : 5 exs., 33-45 mm. SL., Road to Hassan Karkuntha, 30.3.01, F.6826, Coll. G. Thirumalai; 5 exs., Muppane, Sharavathy river, 12.6.04, F.8043, Coll. Sreekantha *et al.*

Distribution : India : Throughout except Kerala.

Elsewhere : Bangladesh. Myanmar. Nepal. Pakistan.

22. ***Cyprinus carpio communis*** (Linnaeus)

1758. *Cyprinus carpio* Linnaeus, *Systema Naturae,* ed. 10, 1 : 320 (Type-Locality: Europe).

1991. *Cyprinus carpio communis,* Talwar and Jhingran, *Inland Fishes of India and Adjacent. Countries,* Vol. **1** : 184-186.

1999. *Cyprinus carpio communis,* Jayaram, *The Freshwater Fishes of The Indian Region,* : 91.

Material examined : 1 ex, Ammer pelli tank near Ammerhalli, dist. Kolar, M.B. Rao, 11.3.1978; 3 exs., 140-178 mm S.L., Road to Hassan, Karkuntha, Hassan Dist., 30.3.01., F. 6824., Coll. G.Thirumalai; 1 ex., 80 mm.SL., Harangi Reservoir, 8.9.98, F.5788, Coll. M.B. Raghunathan; 8 exs., 24-33 mm.SL., Beerandahalli, K.G.F. Kolar Dist., 28.9.07, F.8086, Cooll. S. Prabakaran; 8 ex., 70-196 mm.SL., Munganahalli, 23.3.02, F.6899, F.6912, F.6927, Coll. S. Krishnan; 6 exs., 46-91 mm.SL., Naickarpalaya Kere, 18.3.02, F.6933, Coll. S. Krishnan; 1 ex., 143 mm.SL., Thattekere, Bannerghatta N.P., 18.3.03, F.7299, Coll. S. Krishnan; 1 ex., 49 mm.SL., Khajikalla Halli, Kolar Dist., 15.3.02, F.6897, Coll. S.Krishnan; 1 ex., 194 mm. SL., BEML Township Outer, 22.3.02, Coll. S. Krishnan; 2 exs., 70-80 mm.SL., Chintamani, 23.3.02, F.6957, Coll. S.Krishnan; 1 ex., 37 mm.SL., Narasapura, Kolar Dsit.,15.3.02, F.6969, Coll. S. Krishnan.

Distribution : Naturally found all through America, China, Europe, Japan, Korea, Taiwan. Introduced into India in 1939.

23. ***Cyprinus carpio specularis*** (Linn.)

1758. *Cyprinus carpio* Linnaeus, *Systema Naturae,* ed. 10, 1 : 320 (Type-Locality: Europe).

1991. *Cyprinus carpio specularis,* Talwar and Jhingran, *Inland Fishes of India and Adjacent. Countries,* Vol. **1** : 184-186.

1999. *Cyprinus carpio specularis* Jayaram, *The Freshwater Fishes of The Indian Region* : 91.

Material Examined : 1 ex., 124 mm. SL., Munganahalli, 23.3.02, F.6900, Coll. S. Krishnan.

Distribution : Naturally found all through America, China, Europe, Japan, Korea, Taiwan. Introduced into India in 1939.

24. ***Tor khudree*** (Sykes)

1839. *Barbus khudree* Sykes, *Trans. zool. Soc. Lond.,* **2** : 357. (Type-locality : Mulla Mutha River *nr.* Poona, Maharashtra).

1991. *Tor khudree* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 303-305.

1999. *Tor khudree* Jayaram, *The Freshwater Fishes of The Indian Region,* : 96.

Material Examined : 2 exs., 113-125 mm.SL., Harangi Reservoir, 8.9.98, F.5781, Coll. M.B. Raghunathan; 1 ex., Nagodi, Sharavathi River, 6.6. 2004, F.8055, Coll. Sreekantha.

Distribution : India: Peninsular India, especially in the hill streams of Karnataka, Kerala, Tamil Nadu and Maharashtra.

Elsewhere : Sri Lanka.

25. ***Tor neilli*** (Day)

1839. *Barbus neilli* Day, *Proc. zool. Soc. Lond.*: 581(Type-locality: Madras Presidency).

1999. *Tor khudree* Jayaram, *The Freshwater Fishes of The Indian Region,* : 96.

Material Examined : 1 ex., 120 mm. SL., Gundia River, Nov. 2003, F.7952, Coll. M.S. Ravichandran.

Distribution : India : Cauvery, Krishna and Tungabhadra river systems in Western Ghats. Also Kurnool.

Remarks : *Barbus neilli* was considered a synonym of *Tor khudree* by Talwar & Jhingran (1991) and Menon (1999). Jayaram (1999) considered it a distinct species and that it is a rare specimen and has not been reported for the past fifty years. One specimen answering to the description of *neilli* was collected and is reported here.

26. ***Osteobrama cotio peninsularis*** Silas

1952. *Osteobrama cotio var. peninsularis* Silas, *Proc. nat. Inst. Sci. India*, **18**(5): 433. (Type locality : Poona)

1991. *Osteobrama cotio peninsularis,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 240.

1999. *Osteobrama cotio peninsularis*, Jayaram, *The Freshwater Fishes of The Indian Region* : 102.

Material Examined : 1 ex., 67 mm. SL., N.R. Pura, 20.6.02, F.7019, Coll. M.B. Raghunathan.

Remarks : New record to Karnataka.

Distribution : India : Peninsular India, Andhra Pradesh, Maharashtra, Karnataka and Orissa.

27. ***Puntius amphibius*** (Valenciennes)

1842. *Capoeta ampbhibia* Valenciennes, *Hist. nat. Poiss.*, **16** : 282, pl. 478. (Type-locality: Bombay).

1991. *Puntius amphibius*, Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 257-258

1999. *Puntius amphibius,* Jayaram, *The Freshwater Fishes of The Indian Region* : 110.

Material Examined : 52 exs, Nethravati river, pane Mangalore, S.S. Kamble, 29.81991, 12 exs, Tank near Netty, S. Kanara, S.S. Kanble, 8.9.1991, 1ex, Doddahasale lake, Kolar, M.B. Rao, 10.3.98, 20exs, Uppinangdi, S.S. Kanble, 4.9.91, 1ex, Sulkeri river 12 Km. from Karkale on Belthangady road, P.P. Kulkarni 17.2.1992, 20exs, Kota, S.S. Kanble, 15.9.1991, 1ex, Bombar belt, 21km. from karkalla on P.P. Kulkarni, 18.2.1992, 1ex, Kupetti river, Tal. Belthangady S.S. Kanble 5.9.1991, 2 exs, Jolsur, south Karnara S.S. Kanble, 1.9.1991, 5exs, Halady, S. Kanara, S.S. Kanble 12.9.1991, 4exs, Mashid Basalguntha pond, Mulbagal, Dist. Kolar M.B. Rao, 8.3.1978 30exs, Vijayapura tank, Dist. Kolar, M.B. Rao, 19.3.78, 30exs, Subramanyam, S. Kanara, S.S. Kanble, 12.9.1991 5exs, Yenna hulli, S. Kanara S.S. Kanble, 7.9.1991, 15exs, Dhanasthala, S. Kanara, S.S. Kanble, 7.9.1991; 7 exs., 36-73 mm. SL., Puthur, 17.9.98, F.5779, Coll., M.B. Raghunathan.

Distribution : India : Peninsular India upto Orissa and Rajasthan.

Elsewhere : Sri Lanka.

28. ***Dawkinsia arulius arulis*** (Jerdon)

1849. *Systomus arulius* Jerdon, *Madras J. Lit. & Sci.*, **15** : 317. (Type locality : Cauvery River at Sriranapathnam)

1991. *Puntius arulius arulius,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 258-259.

1999. *Puntius arulius arulius,* Jayaram, *The Freshwater Fishes of The Indian Region* : 110.

Material Examined : 2 exs., 83-86 mm. SL., Harangi Reservoir, 8.9.98, F.5786, Coll. M.B. Raghunathan.

Distribution : India: Cauvery river system and its upper and middle reaches in Karntaka; Wayanad and Nilgiri hills, as far south as Kottayam in Kerala.

29. ***Puntius bimaculatus*** (Bleeker)

1864. *Gnathopogon bimaculatus* Bleeker, *Verh. Nat. Holl. Maatsch. Haarlem,* (2) **20** : 17, pl. 4, fig.1 (Type-locality : Ceylon).

1991. *Puntius bimaculatus,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 259-260.

1999. *Puntius bimaculatus,* Jayaram, *The Freshwater Fishes of The Indian Region* : 110.

Material Examined : 3 exs.., 34-36 mm S.L., Road to Hassan, Javagal, Hassan Dist., 30.3.01., F. 6785., Coll. G. Thirumalai; 1ex., 33mm S.L., Road to Mandya, Hassan Dist., 8401., F,6801., Coll. G. Thirumalai; 3 exs., 23-30 mm S.L., Road to Belur, BhommiHalla, Hassan Dist., 31.3.01., F. 6811., Coll. G. Thirumalai; 1 ex., 29 mm S.L., Road to Hassan., 30.3.01., F.6821., Coll.G Thirumalai; 15 exs., 20-37 mm S.L., Mysore., April, 2000., Coll. S. Krishnan; 1 ex., 33mm S.L. Mysore., April, 2000., Coll. S. Krishnan; 2 exs., 39-40 mm S.L. Mysore, April, 2000., Coll. S. Krishnan; 6 exs., 33-46 mm S.L., Melkoto W.L.S. Bevugal, R.F. Mandya Dist., 10.4.01., F.6775., Coll. G. Thirumalai; 6exs., 27-48mm S.L. Vastara, Chikmagalur Dist., 21.3.03., F. 7317., Coll. S. Krishnan; 7 exs., 16-20 mm.SL., Beerandahalli, K.G.F., Kolar Dist., 28.9.07, F.8087, Coll. S. Prabakaran; 2 exs., 24-28 mm.SL., Devarayandurge, Tumkur Dist., 23.9.07. F.8134, Coll. S. Prabakaran;10 exs., 16-35 mm.SL., Bangalore Dist., 28.12.01, F.6866, Coll. M.B. Raghunathan; 1 ex., 23 mm. SL., Hosuhuddia Halli Road, Kolar Dist., 20.12.01, Coll. M.B. Raghunathan;42 exs., 15-59 mm.SL., Kuduvathi, 15.12.01, F.7076, Coll. M.B. Raghunathan; 8 exs., 42-56 mm.SL., Mullaght Highway, Kolar Dist., 22.3.02, COll. S. Krishnan; 12 exs., 50-56 mm. SL., BEML Township, Outer Tank, 22.3.02, F.6918, Coll. S. Krishnan; 1 ex., 27 mm.SL., Holasahalli, 19.3.02, Coll. S. Krishnan; 1 ex., 38 mm.SL., Magdi Tank, 18.3.02, F.6938, Coll. S. Krishnan; 1 ex., 35 mm. SL., Narasapura, Kolar Dist., 15.3.02, F.6968, Coll. S. Krishnan; 6 exs., 29-48 mm. SL., Gaddhealla, Bannerghatta National Park, 15.3.03, F.7293, Coll. S. Krishnan; 3 exs., 38-42 mm.SL., Udigebandi, Bennarghatta N.P. 16.3.03, F.7302, Coll. S. Krishnan, 2 exs., 38-40 mm.SL., Chikarahalli, annerghatta N.P. 16.3.03, F.7311, Coll. S. Krishnan; 4 exs., 24-34 mm. SL., MuthyalaMaduvu, 15.3.03, F.7350, Coll. G.Thirumalai, 2 exs., 17-21 mm. SL., Ebella, 14.9.03, Coll. G. Thirumalai; 1 ex., 18 mm.SL., Golla Halle SElu, 20.3.04, Coll. K. Rema Devi, 6 exs., 21-60 mm.SL., Moolegundi, 18.3.04, F.7367, Coll. K. Rema Devi; 1 ex., 42 mm.SL., Uruganthotti, 19.3.04, F.7376, Coll. K. Rema Devi; 1 ex., 45 mm.SL., Hosekere New Tank, Bantanallu, 23.3.04, F.7383, Coll. K. Rema Devi; 1 ex., 42 mm.SL., Beethahalli Kavalu, 23.3.04, F.7384, Coll. K. Rema Devi; 68 exs., 23-56 mm. SL., Thalebande, 24.3.04, F.7386, Coll. K. Rema Devi; 2 exs., 21-23 mm. SL., Uthigabande, 18.3.04, Coll. K. Rema Devi; 2 exs., 32-80 mm. SL., Bantanalu, 23.3.04, F.7393, Coll. K. Rema Devi; 40 exs., 29-43 mm. SL., Ghaddehalla, 17.3.04, F.7395, Coll. K. Rema Devi; 6 exs., 26-45 mm. SL., Uchanakunte, 18.3.04, F.7403, Coll. K. Rema Devi; 1 ex., 23 mm.SL., Muninagaram, 22.3.04, Coll. K. Rema Devi; 2 exs., 27-33 mm.SL., Sri Rangapattinam, Palahalli, 14.12.05, F.7834, Coll. M.S. Ravichandran;3 exs., 24-27 mm.SL., Seenapanthotti, Chamaraj Dist., 20.12.05,

F.7843, Coll. M.S. Ravichandran; 3 exs., 17-22 mm.SL., Malenallasandra, Bangalore Dist., 10.12.05, F.7847, Coll. M.S. Ravichandran; 14 exs., 24-28 mm. SL., Ramasany Canal, Mysore Dist., 17.12.05, F.7855, Coll. M.S. Ravichandran; 6 exs., 19-25 mm.SL., Thalasahalli, Sri Rangapattinam, 14.12.05, F.7860, Coll. M.S. Ravichandran; 4 exs., 15-18 mm. SL., Puttenakunti, 9.12.05, F.7882, Coll. S. Prabakaran; 12 exs., 26-31 mm.SL., Medikere, Chittahalli, 24.12.05, F.7897, Coll. S. Prabakaran; 10 exs., 15-30 mm. SL., Balakola Canal, Mysore Dist., 16.12.05, F.7904, Coll. S. Prabakaran; 6 exs., 19-36 mm.SL., Krishnarajasagar, Mysore Dist., 16.12.05, F.7915 , Coll. S. Prabakaran; 4 exs., 29-30 mm.SL., Kanchanaya Kanahalli, Hassan Dist., 27.12.05, F.7923, Coll. S. Prabakaran; 11 exs., 14-25 mm.SL., Gabbadi Kere, Bangalore Dist., 11.12.05, F.7938, Coll. S.Prabakaran; 2 exs., 18-25 mm.SL., Madhavapatna, Coorg Dist., 14.9.06, F.7970, Coll. S. Prabakaran; 2 exs., 21-22 mm. SL., Bhagamandala, Coorg Dist., 13.9.06, F.7976, Coll. S. Prabakaran; 5 exs., 21-25 mm.SL., Thalakavery, 13.9.06, F.7985, Coll. S. Prabakaran; 1 ex., 15 mm. SL., Uttegu Seegude, Chicmagalur Dist., F.7992, Coll. S. Prabakaran.

Distribution : Southern India.

Elsewhere : Sri Lanka.

30. ***Puntius cauveriensis*** (Hora)

1937. *Barbus cauveriensis* Hora, *Rec. Indian Mus.,* **39**(1) : 20, fig. 7 (Type–locality : Cauvery river, Coorg, Karnataka State).

1991. *Puntius cauveriensis, Talwar* and Jhingran, *Inland Fishes of India and Adjacent Countries, Vol.* **1** : 263.

1999. *Puntius cauveriensis,* Jayaram, *The Freshwater Fishes of The Indian Region* : 111.

Material Examined : 3exs, Appayya kunta, chikkaballapur, dist. Kolar, M.B. Rao. 17.3.1978, 7 exs, Nagarhole stream, sunkadakatte, Nagarhola, M.S. Pradhan, 24.3.1991; 1 ex., 20 mm SL., Chichrahalli, 16.3.03, F.7312, Coll. S. Krishnan;

Distribution : India : Cauvery River. Tamil Nadu, Karnataka and Kerala.

31. ***Puntius chola*** (Hamilton)

1822. *Cyprinus chola* Hamilton-Buchanan, *Fishes of Ganges* : 312, 389. (Type-locality: Northeastern parts of Bengal).

1991. *Puntius chola,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 263-265.

1999. *Puntius chola,* Jayaram, *The Freshwater Fishes of The Indian Region*: 111.

Material Examined : 2 exs., 66-71 mm.SL., N.R. Pura, 20.6.02, F.7020, Coll. M.B. Raghunathan; 4 exs., 37-43 mm. SL., Mysore, April 2000, Cool. S. Krishnan; 1 ex., 68 mm.SL., Thattekere, 18.3.02, F.7300, Coll. S. Krishnan; 1 ex., 51 mm.SL., Matheswara Kere, 14.9.03, F.7344, Coll. G. Thirumalai; 5 exs., 26-59 mm.SL., Muninagara, 22.3.04, F.7412, Coll. K. Rema Devi; 2 exs., 339 mm.SL., Medikere, Kodagu, 23.12.05, F.7885, Coll. S. Prabakaran ; 1 ex., 54 mm.SL., Medekere, Chittahalli, 24.12.05, F.7896, Coll. S. Prabakaran; : 6 exs., 73-90 mm.SL., Kondanjji, Davengere Dist., 18.9.07, F.8102, Coll. S. Prabakaran ; 3 exs., 45-112, Uruganthottai, 19.3.04, F.7373, Coll. K. Rema Devi; 1 ex., Nandihole, June 2003, F.8078, Coll. Sreekantha; 3 exs., Holebagilu, June 2002, F.8070, Coll. Sreekantha.

Distribution : Throughout India.

Elsewhere : Bangladesh. Myanmar. Nepal. Pakistan. Sri Lanka.

32. ***Pethia conchonius*** (Hamilton)

1822. *Cyprinus conchonius* Hamilton, *Fishes of Ganges* : 317, 389 (Type-locality: Ponds of north east Bengal and Kosi river and Ami river).

1991. *Puntius conchonius,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 266.

1999. *Puntius conchonius,* Jayaram, *The Freshwater Fishes of The Indian Region* : 111.

Material Examined : 30exs, Nagarhole stream, Sunkadakatte, Nagarhole, M.S. Pradhan, 24.3.1991; 36 exs., 18-67 mm S.L., Mysore., April, 2000., Coll. S. Krishnan; 47 exs., 30-49 mm S. L., Road to Hassan Dist., Javagal., 30.3.01., F.6786., Coll. G. Thirumalai; 48m exs., 26-52 mm S.L., Road to Mandya., Hassan Dist., 8.4.01., F.

6802., Coll. G. Thirumalai; 165 exs.,12-45 mm S.L., Road to Hassan to Patna, 3.4.01., F. 6814., Coll. G. Thirumalai; 144 exs., 12-57 mm S.L., Road to Hassan, Karkunta., 30.3.01., F. 6820, 6828., Coll. G. Thirumalai; 180 exs., 23-43 mm S. L., Melkoto W.L.S., Bevugal R.F., Mandya Dist., 10.4.2001., F. 6774., Coll. G. Thirumalai; 1 exs., 43mm S.L., River Cauveri., Behind S.R. Patna., 7.4.01., F. 6836., Coll. G. Thirumalai; 6 exs., 14 -21 mm S.L., Kanathy, Chigmalur Dist., 16.6.02., Coll. M.B. Raghunathan; 2exs., 16-19 mm S.L., Kadur, Chigmagalur Dist., 25.6.02., F.7031., Coll. M.B. Raghnathan.; 2 exs., 24-27 mm. SL., Puthur, 17.9.98, F.5780, Coll. M.B. Raghunathan; 1 ex., 50 mm. SL., Harangi Reservoir, 8.9.98, F.5787, Coll. M.B. Raghunathan; 166 exs., 14-50 mm.SL., Ramasagar, Kolar Dist., 27.9.07, F.8092, Coll. S. Prabakaran;1 ex., 32 mm.SL., Hallayella , Haveri Dist., 13.9.07, F.8119, Coll. S. Prabakaran;2 exs., 12-57 mm.Sl., Seerahalli, Road to Tiptur, 1.4.01, F.6820, Coll. G. Thirumalai; 122 exs., 20-45 mm.SL., Road to Hassan Dist, Karukuntha, 30-3-01, F.6828, Coll. G. Thirumalai, 17 exs., 38-43 mm. SL., Kanva reservoir, Banglore and Kolar Dist., 16.3.02, F.6963, Coll. S. Krishnan; 30 exs.,24-48 mm.SL., Palahalli, Srirangapattinam, 14.12.05, F.7833, Coll. S. Prabakaran; 1 ex., 43 mm.SL., Seenapanthotti, Chamraj Nagar, Dist., 20.12.05, F.7844, Coll. S. Prabakarn; 2 exs., 50-55 mm.SL., Ramasany Canal, Mysore Dist., 17.12.05, F.7856, Coll. S. Prabakaran; 18 exs., 20-45 mm.SL., Thalasahalli, Srirangapattinam, 14.12.05, F.7861, Coll. S. Prabakaran, 1 ex., 30 mm.SL., Balakola, Mysore Dist., 16.12.05, F.7905, Coll. S. Prabakaran; 4 exs., 30-34 mm.SL., Krishnarajasagar, 16.12.05, F.7916, Coll. S. Prabakaran; 9 exs., 19-38 mm. SL., Kachanaya kanahalli, Hassan Dist., 27.12.05, F.7922, Coll. S. Prabakaran; 18 exs., 22-35 mm.SL., Gevenahalli, Hassan Dist., 28.12.05, F.7936, Coll. S. Prabakaran; 18 exs., 22-30 mm.SL., Thimmanahalli, Hassan Dist., 28.12.05, F.7940, Coll. S. Prabakaran; 3 exs., 55-65 mm.SL., Near Zoo, Mysore dist., 18.12.05, F.7944, Coll. S. Prabakaran; 2 exs., 23-26 mm. SL., Bhagamandala, Coorg Dist., 13.9.06, F.7977, Coll. S. Prabakaran; 2 exs., 22-24 mm. SL., Thalakavery, Coorg Dist., 13.9.06, F.7986, Coll. S. Prabakaran; 2 exs., 25-43 mm.SL., Chamarajnagr Dist., 20.12.05, F.7874, Coll. S. Prabakaran.

Distribution : Throughout India.

Elsewhere : Bangladesh. Nepal. Pakistan.

33. ***Puntius dorsalis*** (Jerdon)

1849. *Systomus dorsalis* Jerdon, *Madras J.Lit. & Sci.*, **15** : 314 (Type-locality: Tanks and rivers in neighbourhood of Madras).

1991. *Puntius dorsalis* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries*, Vol. **1** : 268-269.

1999. *Puntius dorsalis*, Jayaram, *The Freshwater Fishes of The Indian Region* : 112.

Material Examined : 9ex, Kollur, Dist. S. Kanara, S.S. Kanble, 13.9.1991; 1 ex., 61mm S.L., Mysore, April, 2000., Coll. S. Krishnan.

Distribution : India : Cauvery and Krishna River systems in Andhra Pradesh, Karnataka, Tamil Nadu, Kerala, Orissa & Madhya Pradesh.

Elsewhere : Sri Lanka.

34. ***Dravidia fasciatus fasciatus*** (Jerdon)

1849. *Cirrhinus fasciatus* Jerdon, *Madras J. Lit. & Sci.*, **15** : 305 (Type-locality : Malabar).

1865. *Labeo melanampyx* Day, *Proc. Zool. Soc. Lond.*, p. 317, (Type-locality : Wynaad).

1991. *Puntius fasciatus*, Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries*, Vol. **1** : 269-270.

1999. *Puntius fasciatus fasciatus*, Jayaram, *The Freshwater Fishes of The Indian Region* : 112.

Material Examined : 1ex, stream, w. of T.B. Kotigehar, Chickmangalure, Mysore, B.K. Tikader, 2.2.1964; 2 exs., 22-40 mmSL., Balichathru Thodu, 22.11.03, F.7953, Coll. S. Krishnan; 3 exs., Chengualli stream, Sharavathi River, 17.7. 2004, F.8074, Coll. Sreekantha.

Distribution : India : Wynaad, Nilgiri hill range in kerala and Karanataka.

Distribution : Peninsular India: Western Ghats

: Goa, South Canara through Travancore hills to Nagercoil. Also Nilgiris, Cauvery drainage.

35. *Dravidia fasciatus pradhani* Tilak

1973. *Puntius malanmpyx pradhani* Tilak, *Rec. zool. Surv. India,* **67**(1 to 4): 97, fig. 2,3,4 (Type-locality : molem, Goa).

1999. *Puntius fasciatus pradhani,* Jayaram, *The Freshwater Fishes of The Indian Region* : 112.

Material Examined : 1ex, Bomber belt 21 kms. From Karkal, P.P. Kulkarni, 18.2.1992, 20exs, Kupetti river, Tal. Belthalgady, P.P. Kulkarni, 11.2.1992, 1ex Kali river 4 km. from Ganeshgudi Supadam, R.M.S. Sharma, 15.9.1991, 4exs, Nallah near Murlia village, Tal. Sullia, P.P. Kulkarni, 7.2.1992, 2exs, Jolsur, south Kanara, S.S. Kamble, 1.9.1991.

Distribution : India: Goa, Karanataka: South Kanara.

Remarks : This is a new repot to Karnataka.

36. *Dawkinsia filamentosus* (Valenciennes)

1844. *Leusiscus filamentosus* Valenciennes (in C&V) *Hist. Nat. poiss.,* **17** : 95, Pl. 492 (Type-locality: Alleppy).

1991. *Puntius filamentosus,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 270-271.

1999. *Puntius filamentosus,* Jayaram, *The Freshwater Fishes of The Indian Region* : 112.

Material Examined : 7exs, Badaga Kavandur, S.S. Kanble, 10.9.1991, 1ex, Nalla near Painja village, Tal. Sullia, P.P. Kulkarni, 8.2.1992, 5exs, stream near Belthangadi, S.S.Kanble, 5.9.1991, 1ex, Halady, S. Kanara, S.S. Kanble, 12.9.1991, 1ex, Yenna hulli, S.S. Kanble, 7.9.1991, 10exs, Subramanyam, S. Kanara S.S. Kanble, 12.9.1991, 1ex, tank near Nette dist. S. Kanara, S.S. Kanble, 8.9.1991; 4 exs., 60-74 mm. SL., Gundia River, Kodagu Dist., Nov. 2003, F.7630, Coll. M.S. Ravichandra; 1 ex., 23 mm.SL., Frangipet, 18.9.06, F.7962, Coll. S. Prababkaran.

Distribution : India : Cauvery and Krishna River systems in Andhra Pradesh, Karnataka, Tamil Nadu, Kerala, Goa.

Elsewhere : Sri Lanka.

37. *Puntius mudumalaensis* Menon and Rema Devi

1992. *Puntius mudumalaensis* Menon and Rema Devi, *J. Bombay nat. Hist. Soc.*, **89**(2) : 229-231 (Type locality: Kakkanhalla Road, Mudumalai, Tamil Nadu).

1999. *Puntius mudumalaensis* Menon, Check List Fresh water Fishes of India, *Zool. Surv. India, Occ. Pap. No.* **174** : 97.

1999. *Puntius mudumalaensis,* Jayaram, *The Freshwater Fishes of The Indian Region* : 113.

Material Examined : 1 ex., 21 mm. SL., Kadur, 25.6.02, F. 7033, Coll. M.B. Raghunathan ; 1 ex., 22 mm.SL., Road to Tiptur, Seerahalli, 1.4.01, Coll. G. Thirumalai; 3 exs., 20-25 mm.SL., Yelhanka, Bangalore, 17.12.01, F.6877, Coll. M.B. Raghunathan;1 ex., 22.5 mm.SL., Kanva Reservoir, 16.3.02, F.6962, Coll. S. Krishnan.

Distribution : India : Cauvery River system in Karnataka and Tamil Nadu.

38. *Puntius parrah* Day

1865. *Puntius parrah* Day, *Proc. Zool. Soc. Lond.*: 301 (Type locality : Kuriavanoor nr. Trichur, Kerala).

1991. *Puntius parrah,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 277-278.

1999. *Puntius parrah,* Jayaram, *The Freshwater Fishes of The Indian Region* : 113.

Material Examined : 1 ex., 90 mm.SL., Mysore, April 2000, Coll. S. Krishnan.

Distribution : India: Karnataka, Kerala, southern Maharashtra and Tamil Nadu.

39. *Pethia phutunio* (Hamilton)

1822. *Cyprinus phutunio* Hamilton, *Fishes of Ganges,* pp.319, 390. (Type-Locality : North eastern Bengal).

1991. *Puntius phutunio,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 278-279.

1999. *Puntius phutunio,* Jayaram, *The Freshwater Fishes of The Indian Region*: 113.

Material Examined : 2exs, Belgaum Dist, Mysore, B.K. Tikader, 11.2.1965.

Distribution : India : Goa, Karnataka, Bihar, Orissa, W. Bengal, Assam, Tripura. Punjab.

Elsewhere : Bangladesh. Myanmar. Pakistan.

Remarks : It is a new record from Karanataka state.

40. ***Pethia punctatus*** (Day)

1865. *Barbus punctatus* Day, *Proc. Zool. Soc. London*: 302 (Type locality : Cochin).

1999. *Puntius punctatus,* Menon, Checklist–Freshwater Fishes of India. *Rec. zool. Surv. India, Occ. Paper No.* **175** : 99.

Material Examined : 1 ex., 22 mm.SL., Kaniyur, D. Kannada Dist., 29.11.03, F.7947, Coll. S. Krishnan; 2 exs., 22-27 mm.SL., Frangipet, 18.9.06, F.7961, Coll. S. Prababkaran.

Distribution : India : Kerala; Tamil Nadu: Tirunelveli (Tambraparni drainage) and Anamalai Hills; Karnataka : Cauvery river.

Elsewhere : Sri Lanka.

41. ***Puntius sophore*** (Hamilton)

1822. *Cyprinus sophore* Hamilton, *Fishes of Ganges,* pp. 310, 389, pl. 19, fig. 86. (type-locality: Ponds and rivers in the Gangetic provinces).

1991. *Puntius sophore,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 288-289.

1999. *Puntius sophore,* Jayaram, *The Freshwater Fishes of The Indian Region* : 114.

Material Examined : 11exs., Near Kuppam tank, Bangarpet Dist. Kolar, M.B. Rao, 6.3.78, 5exs, Appaya kunta, Chikkaballapur, dist. Kolar, M.B. Rao, 17.3.1978, 1ex, Gavana tank, Siddalghata, Chintamani, Dist. Kolar, M.B. Rao, 15.3.1978, 5exs, Abdul Ali Garden, Bangarpet, Dist. Kolar, M.B. Rao, 6.3.1978; 2 exs., 77-80 mm S.L., Mysore, April, 2000., Coll. S. Krishnan; 1 ex., 65 mm S.L., Road to Hassan, Karkuntha, 30.3.01., F. 6829., Coll. G. Thirumalai; 3 exs., 60 -65 mm S. L., N.R. Pura, Chikmagalur Dist., 20.6.02., F. 7021., Coll. M.B. Raghuanthan; 6 exs., 17-37 mm S.L., Kadur, Chikmagalur Dist., 25.6.02, F. 7030., Coll. M.B. Raghunathan ; 1 ex., 75 mm.Sl., Kondanjji, Davengere, Dist.,18.9.07,F.8101, Coll. S. Prabakaran; 1 ex., 44 mm.SL., Uyyampalli, 17.3.02, F.6892, Coll. S. Krishnan; 6 exs., 18-72 mm.SL., Munganahalli, 23.3.02, F. 6898, Coll. S.Krishnan; 16 exs., 22-49 mm.SL., Kambaina Halli, 24.3.02, F.6922, Coll. S. Krishnan; 1 ex., 64 mm.SL., Munganahalli, 23.3.02, F.6926, Coll. S.Krishnan; 17 exs., 43-57 mm.SL., Uyyampalli, 17.3.02, F.6943, Coll. S. Krishnan; 2 exs., 26-33 mm.SL., Jangamkote, 24.3.02, F.6950, Coll. S.Krishnan; 3 exs., 46-65 mm.SL., Chintamani, 23.3.02, F.6958, Coll. S. Krishnan; 2 exs., 42-43 mm.SL., Kanva Reservoir, 16.3.02, F.6961, Coll. S.Krishnan; 2 exs., 28-56 mm.SL., BEML Township Outer, 22.3.02, F.6905, Coll. S.Krishnan.

Distribution : Throughout India.

Elsewhere : Bangladesh. Myanmar. Nepal. Pakistan. Sri Lanka.

42. ***Pethia ticto*** (Hamilton)

1822. *Cyprinus ticto* Hamilton, *Fishes of Ganges,* pp. 314. (Type-Locality: South eastern parts of Bengal).

1999. *Puntius ticto,* Menon, Check list–Freshwater Fishes of India. *Rec. zool. Surv. India, Occ. Paper No.* **175** : 103-104.

Material Examined : 2 exs, Kapinadka Bridge on Dharmasthal-Karkala Road, P.P. Kulkarni, 12.2.1992, 7exs, Kupetti river, Tal. Belthangady, P.P. Kulkarni, 11.2.1992, 37exs, Yagachi river, Chikmagalur, Mysore, B.K. Tikader, 20.1.1964, 21exs, Sagar, Dist. Shimoga, Mysore, B.K. Tikader, 28.2.1965; 8exs., 23-31 mm S.L., Mysore, April, 2000., Coll. S. Krishnan; 1ex., 28 mm S.L., Road to Hassan Dist., Javagal, 30.3.01., F. 6796., Coll. G. Thirumalai; 5exs., 28-35 mm S. L., Hassan to Kalkere., 24.4.01., F. 6833., Coll. G. Thirumalai; 1 ex.,19mm S.L., Jannapura, 15.6.02., Coll. M.B. Raghunathan; 4 exs., 28-35 mm S.L., Honagodu, Chikmagalur Dist., 18.6.02., F. 7009, Coll. M.B. Raghunathan; 2 exs., 30-32 mm S.L., Sringeri, Agumbe, Chikmagalur Dist., 19.6.02., F. 7016., Coll. M.B. Raghunathan; 1ex., 30mm S.L., Nimmar, Chikmagalur Dist., 26.3.03., F. 7329., Coll. S. Krishnan; 4 exs., 22-30 mm.SL., Hallayella, Haveri Dist., 13.9.07, Coll. S. Prabakaran; 12 exs., 18-21 mm.SL., Balakola Canal, Mysore Dist., 16.12.05, F.7906, Coll. S. Prabakaran; 10 exs., 19-23 mm.SL., Krishnarajasagar, Mysore, 16.12.05, F.7917. Coll.

S. Prabakaran; 34 exs., 22-28 mm.SL., Medikere, Pettikere, 23.12.05, F. 7932, Coll. S. Prabakaran; 12 exs., 15-25 mm.SL., Bhagamandala, Coorg Dist., 13.9.06, F.7975, Coll. S. Prabakaran; 6 exs., 15-22 mm.SL., Thalakavery, 13.9.06, F.7987, Coll. S. Prabakaran; 16 exs., 20-26 mm.SL., Appangaro Medikere, Kodagu, 23.12.05, F.7886, Coll. S. Prabakaran.

Distribution : India: except Kerala and South Tamil Nadu.

Elsewhere : Nepal. Pakistan. Bangladesh.

43. ***Puntus vittatus*** (Day)

1865. *Puntius vittatus* Day, *Proc. Zool. Soc. Lond.* P. 303, (Type-Locality: Madras).

1991. *Puntius vittatus,,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 293-294.

1999. *Puntius vittatus,,* Jayaram, *The Freshwater Fishes of The Indian Region* 114.

Material Examined : 1ex, Nalla near Panja village, Tal. Sullia, P.P. Kulkarni, 8.2.1992, 8exs, Vijayapura tank, Dist. Kolar, M.B. Rao, 19.3.1978, 5exs, Nalla, Moroli village, S. Kanara, Mysore, B.K. Tikader, 6.2.1964; 3 exs., 15.5-20 mm S.L., Kadur., Chikmagalur Dist., 25.6.02., F. 7032., Coll. M.B. Raghunathan; 76 exs., 11-28 mm.SL., Mangalore, 18.906, F.7995, Coll. S. Prabakara; 5 exs., 13-28 mm.SL., Farangipet, Mangalore, 18.9.06, F.7963, Coll. S. Prabakaran; 59 exs., 14-23 mm.SL., Addayar, Mangalore, 18.9.06, F.7957, Coll. S. Prabakaran; 1 ex., 31 mm.SL., Poodhipadiga, Chamarjnagar Dist., 20.12.05, Coll. S. Prabakaran; 3 exs., 20-28 mm.SL., Ramasany Canal, Mysore Dist., 17.12.05, F.7857, Coll. S. Prabakaran; 1 ex., 17 mm.SL., Malenallasandra, 10.12.05, F.7847, Coll. S. Prabakaran.

Distribution : India : Tamil Nadu, Kerala, Karanataka, up to Goa and Kutch, Orissa, Rajastan.

Elsewhere : Pakistan. Sri Lanka. Thailand.

44. ***Barbodes bovanicus*** (Day)

1878. *Barbus bovanicus* Day, *Fishes of India*: 566 pl. 138, fig. 1. (Type locality: Bowani River at base of Nilgiri Hills).

1999. *Barbodes bovanicus,* Menon, Check list–Freshwater Fishes of India. *Rec. zool. Surv. India, Occ. Paper No.* **175** : 68.

Material Examined : 1 ex., 60 mm.SL., Thalakavery, 14.12.05, F.7859, Coll. S. Prabakaran.

Distribution : India : Cauvery River system: Tamil Nadu and Karanataka.

45. ***Systomus sarana sarana*** (Hamilton)

1822. *Cyprinus sarana* Hamilton, *Fishes of Ganges*, pp. 307, 388. (Type-Locality: Gangetic system, Bengal).

1991. *Puntius sarana sarana,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 283-284.

1999. *Barbodes sarana sarana,* Menon, Check list-Freshwater Fishes of India. *Rec. zool. Surv. India, Occ. Paper No.* **175** : 70-72.

Material Examined : 1ex, Kali river 4 km.from Ganeshgudi supadam, R.M. Sharma, 15.9.1991, 1ex Belgaum Dist. Mysore, B.K. Tikader, 11.2.1965.

Distribution : Throughout India, North of Krishna river system.

Elsewhere : Pakistan, Nepal, Bangladesh, Myanmar.

Remarks: It is a new record from Karanataka state.

46. ***Systomus sarana subnasutus*** (Valenciennes)

1842. *Barbus subnasutus* Valenciennes, *Hist. nat. Poiss.,* **16** : 154 (Type-locality: Pondicherry).

1991. *Puntius sarana subnasutus,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 285-286.

1999. *Barbodes sarana subnasutus,* Menon, Check list-Freshwater Fishes of India. *Rec. zool. Surv. India, Occ. Paper No.* **175** : 72-73.

Material Examined : 1ex, Nethravati river, pane Mangalore, dist. S. Karana, S.S. Kanble, 29.8.1991.; 2exs., 30-30.5 mm S.L., Narsipura., Chikmagalur Dist., 28.3.03., F. 7279., Coll. S. Krishnan; 1 ex., 63 mm.Sl., Matheswara Kere, 14.9.03, F.7341, Coll. G. Thirumalai; 7 exs., 28-42 mm.SL., Palankuppi Valla, 17.9.03, F.7346,

Coll. G. Thirumalai; 1 ex., 91 mm.SL., Uthigabandi,18.3.04, F.7360, Coll. K. Rema Devi; 4 exs., 114-135 mm.SL., Uruganthittai, 19.3.04, F.7375, Coll. K. Rema Devi; 2 exs., 28-55 mm.SL., Muninagaram, 22.3.04, F.7413, Coll. K. Rema Devi; 2 exs., 81-90 mm.SL., Mysore Dist., Near Zoo, 18.12.05, F.7945, Coll. S. Prabakaran.

Distribution : India: Peninsular: Krishna river and South.

47. ***Gonoproktopterus dobsoni*** (Day)

1876. *Barbus (Barbodes) dobsoni* Day, *J. Linn. Soc. Zool.*, **12**: 574, (Type- Locality: Deccan).

1999. *Hypselobarbus dobsoni,,* Menon, Checklist-Freshwater Fishes of India. *Rec. zool. Surv. India, Occ. Paper No.,* **175** : 75-77.

Material Examined : 1 ex., 138 mm. SL. N.R. Pura, 20.6.02, F.6999, Coll. M. B. Raghunathan.

Distribution : India: Western Ghats : Krishna and Cauvery drainages and also Anamalai Hills.

48. ***Gonoproktopterus curmuca*** (Hamilton)

1807. *Cyprinus curmuca* Hamilton, Journey in Mysore, **3**: 344, pl. 30 (Type-locality: Mysore, Western Ghats of India).

1999. *Hypselobarbus curmuca*, Menon, *Checklist-Freshwater Fishes of India. Rec. zool. Surv. India, Occ. Paper No.,* **175** : 75-76.

1999. *Hypselobarbus kolus,* Menon, *Checklist–Freshwater Fishes of India. Rec. zool. Surv. India, Occ. Paper No.,* **175** : 75.

Material Examined : 1 ex., Holebagilu, Sharavathi River, 15.9.2002, F.8057, Coll. Sreekantha.

Distribution : India: Deccan, and Mysore Plateau in the Krishna, Godavry and Cauvery rivers.

49. ***Gonoproktopterus kurali*** Menon and Rema Devi

1995. *Hypselobarbus kurali* Menon & Rema Devi, *J. Bombay nat. Hist. Soc.*, (3): 389-393.

1999. *Hypselobarbus kolus,* Menon, *Checklist – Freshwater Fishes of India. Rec. zool. Surv. India, Occ. Paper No.* **175** : 78-79.

Material Examined : 1 ex., 132 mm. SL., Gundiya River, Nov. 2003, F.7631, Coll. M.S. Ravichandran.

Distribution : India : Dakshina Kannada (South Canara) to Travancore Hills, Tambraparni drainage.

50. ***Osteocheilichthys nashii*** (Day)

1870. *Barbus nashii* Day, *Proc. Zool. Soc. Lond.* : 584 (Type- Locality : Fraserpett river, Coorg Dist., Karnataka).

1991. *Osteochilus (Osteocheilichthys) nashii*, Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 247-248.

1999. *Osteocheilichthys nashii,,* Jayaram, *The Freshwater Fishes of The Indian Region* : 125.

Material Examined : 3 exs., Nagodi, Sharavathi River, Oct. 2003, F.8081, Coll. Sreekantha.

Distribution : India : Western Ghats of Karnataka and Kerala.

Remarks : It is a new record from Karanataka state.

51. ***Osteochilichthys thomassi*** (Day)

1877. *Scaphiodon thomassi* Day, *Fishes of India*: 551, Pl.134, fig.1 (Type- Locality: South Canara).

1991. *Osteochilus (Osteocheilichthys) thomassi*, Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 248-249.

1999. *Osteocheilichthys thomassi,,* Jayaram, *The Freshwater Fishes of The Indian Region* : 125.

Material Examined : 3 exs., 85-96 mm.SL., Gundia River, Non. 2003, F.7632, Coll. M.S. Ravichandran.

Distribution : India : Western Ghats of Karnataka.

52. ***Cirrhinus fulungee*** (Sykes)

1841. *Chondrostoma fulungee* Sykes, *Trans. zool. Soc.* Lond., 2 : 358. (Type-locality: Deccan).

1991. *Cirrhinus fulungee,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 171.

1999. *Cirrhinus fulungee,* Jayaram, *The Freshwater Fishes of The Indian Region* : 130.

Material Examined : 2 exs, Sagar, Dist.

Shimoga, Mysore, B.K.Tikader, 10.3.1965; 1 ex., 87mm S.L., N.R. Pura, Chikmagalur Dist., 20.6.2002., F. 7018., Coll. M.B. Raghunathan; 2 exs., 71-80 mm S.L., Vastara, Chikmagalur Dist., 21.3.03., F.7218., Coll. S Krishnan; 11 exs., 95-113 mm.SL., Kondajji, Davengere Dist., 18.9.07, F.8100, Coll. S. Prabakaran;2 exs., 20-32 mm.SL., Hallayella, Haveri Dist., 13.9.07, F.8121, Coll. S. Prabakaran; 5 exs., 50-71 mm.SL., Mooleygundi, Bannerghatta N.P., 15.3.03, F.7283, Coll. S. Krishnan; 1 ex., 48 mm.SL., Gaddhella, Bannerghatta N.P., 15.3.03, F.7294, Coll. S. Krishnan; 21 exs., 73-110 mm.SL., Uthigabandi, Bannerghatta N.P., 18.3.04, F.7364, Coll. K. Rema Devi; 134 exs., 54-117 mm.SL., Moolegundi, 18.3.04, F.7369, Coll. K.Rema Devi; 26 exs., 35-38 mm.SL., Uthigabandi, Bannerghatta N.P., 18.3.04, F.7390, Coll. K. Rema Devi.

Distribution : Peninsular India, Maharashtra, Karanataka, Krishna & Cauvery river systems.

53. ***Cirrhinus reba*** (Ham-Buch)

1882. *Cyprinus reba*, Hamilton, *Fishes of Ganges*, **280** : 386. (Type-locality: rivers and ponds of Bengal and Bihar).

1999. *Cirrhinus reba* Menon, *Checklist – Freshwater Fishes of India, Rec. zool. Sur. India. Occ. Paper*, **175** : 123-125.

Material examined : 1 ex, Yenna Hulli, S.S. Kanble, 7.9.1991.

Distribution : Throughout India.

Elsewhere : Pakistan, Nepal, Bangladesh, Burma.

54. ***Labeo ariza*** (Hamilton)

1807. *Cyprinus ariza* Hamilton, *Journey in Mysore,* **3** : 344, pl. 31 (Type-Locality: rivers of Peninsular India)

1991. *Labeo ariza,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 198-199.

1999. *Labeo ariza,* Jayaram, *The Freshwater Fishes of The Indian Region,* : 133.

Material Examined : 10 exs., 180-220 mm.SL., Hosekere New Tank, 23.3.04, F.7419, Coll. K. Rema Devi.

Distribution : Nilgiri hills and Cauvery River, Peninsular India and upto Orissa.

55. ***Labeo kontius*** (Jerdon)

1848. *Cyprinus kontius* Jerdon, *Madras J. Lit. & Sci.,* **15** : 302 (Type-Locality: Cauvery and its tributaries)

1991. *Labeo kontius,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 212.

1999. *Labeo kontius,* Jayaram, *The Freshwater Fishes of The Indian Region,* : 134.

Material Examined : 1 ex., Muppane, Sharavathi River, April 2002, F.8062, Coll. Sreekantha.

Distribution : South India: River Cauvery and its tributaries.

56. ***Crossocheilus latius latius*** (Hamilton)

1822. *Cyprinus latius* Hamilton-Buchanan, *Fishes of Ganges;* 345, 393 (Type-Locality: Tista river at base of Darjeeling Himalaya).

1991. *Crossocheilus latius latius*, Talwar and Thingran, *Inland Fishes of India and Adjacent Countries,* Vol. 1 : 212. India, fish, vol. **1** : 416.

1999. *Crossocheilus latius latius,* Jayaram, *The Freshwater Fishes of The Indian Region,* 152-153.

Material Examined : 1ex, Subramanyam, S. Kanara, S.S. Kamble, 12.9.1991.

Distribution : Ganga, Brahmaputra river systems, Deolali, Maharashtra, Mahanadi river drainage in Orissa; and Western Ghats, south to the headwaters of Krishna river. Bangladesh. Nepal. Pakistan.

57. ***Garra gotyla stenorhynchus*** (Jerdon)

1849. *Gonorhynchus stenorhynchus* Jerdon, *Madras J. Lit. & Sci.,* **15** : 310 (Type-Locality: Bowany River, Nilgiris).

1991. *Garra gotyla stenorhynchus* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 422-423.

1999. *Garra gotyla stenorhynchus* Menon, *Checklist– Freshwater Fishes of India., Rec. zool. Sur. India, Occ. Paper*, **175** :144-145.

Material Examined : 2exs, stream near Belthangdi, S.S. Kanble 5.9.1991, 2exs, yenna hulli, S. Kanara, S.S. Kanble 7.9.1991, 1ex, Tank near Nette dist. S. Kanara, S.S. Kanble, 8.9.1991, 1 ex, kupetti river Tal.Belthamgady, S. Kanara,

P.P. Kulkarani, 11.2.1992. 2 exs., 80-95 mm.SL., Kondanjji, Davengere Dist., 18.9 07, F.8103, Coll. S. Prabakaran.

Distribution : India : Western Ghats: Cuvery and Krishna drainages.

58. ***Garra mullya*** (Sykes)

1841. *Chondrostoma mullya* Sykes, *Trans. zool. Soc. Lond.*, 2 : 359, pl.62 fig.3 (Type-locality : Bheema river at Daunde, nr. Poona).

1991. *Garra mullya,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 429.

1999. *Garra gotyla stenorhynchus* Menon, *Checklist–Freshwater Fishes of India., Rec. zool. Sur. India, Occ. Paper*, **175** : 148-150.

Material Examined : 1 ex, Nalla near Panja village, Tal Sullia, P.P. Kulkarni, 8.2.1992, 1 ex, stream near Belthangdi S.S. Kanble, 5.9.1991, 17exs, Kali river near Erde village, Puttur, S. Kanara, P.P. Kulkarani, 7.9.1992, 1 ex, Yenna Halli, S. Karana, S.S. Kanble, 7.9.1991, 2exs, Kupetti river, Tal.Belthangady dist. S. Karana, P.P Kulkarni, 11.2.1992; 29 exs., 43-96 mm S.L., Mysore., April, 2000., Coll. S. Krishnan; 2 exs. 59-62 mm S.L., Road to Mandya, Hassan Dist., 8.4.01., F.6804., Coll. G.Thirumalai; 3exs., 21.5-29 mm S.L., Road to Hassan., Karkuntha., 30.3.01., F. 6822., Coll. G.Thirumalai; 1 ex., 35 mm.Sl., Narasipura, 28.3.03, F.7280, Coll. S. Krishnan; 4 exs., 41-70 mm.SL., Vastara, 21.3.03, F.7319, Coll. S. Krishnan; 1 ex., 26 mm.SL., Hallayella, Haveri Dist., 13.9.07, F.8124, Coll. S. Prabakaran; 3 exs., 21.5-29 mm.SL., Road to Tiptur, Seerahalli, Hassan Dist., 1.4.01, F.6822, Coll. G. Thirumalai; 6 exs., 52-65 mm.SL., Mooleygundi, Bannerghatta N.P., 15.3.03, F.7285, Coll. S. Krishnan; 2 exs., 45-64 mm.SL., Urugunadoddi, Bannerghatta N.P., 18.3.03, F.7308; Coll. S. Krishnan; 1 ex., 61 mm.SL., Uthigabandi, Bannerghatta N.P., 18.3.04, F.7363, Coll. K. Rema Devi; 4 exs., 63-73 mm.SL., Moolegundi, Bannerghatta N.P., 18.3.04, F.7368, Coll. K. Rema Devi; 2 exs., 75-78 mm.SL., Uruganthottai, Bannerghatta N.P., 19.3.04, F.7378, COll. K. Rema Devi; 2 exs., 103-103.5 mm.SL., Gundia River, Karnataka, Nov.2003, F.7633, Coll. M.S. Ravichandran; 1 ex., 25 mm.SL., Kabini River Nanjangudi, Mysore Dist., 15.12.05, F.7892, Coll. S. Prabakaran; 4 exs., 48-59 mm.SL., Balakola Canal, Mysore Dist., 16.12.05, F.7910, Coll. S. Prabakaran; 1 ex., 27 mm.SL., Madhava Patna, Coorg Dist., 14.9.06, F.7969, Coll. S. Prabakaran; 2 exs., Madenur, Sharavathi River, June 2002, F.8079, Coll. Sreekantha.

Distribution : Throughout peninsular India.

59. ***Acanthocobitis botia*** (Hamilton)

1822. *Cobitis botia* Hamilton, *Fishes of Ganges*, pp. 350 : 394. (Type-Locality : Rivers of north eastern part of Bengal).

1987. *Noemacheilus botia*, Menon, *Fauna of India, Pisces*, vol. **4** : 141, pl. 5, fig.5, *Zool. Surv. India.*

1999. *Acanthocobitis botia*, Jayaram, *The Freshwater Fishes of the Indian Region* : 173-174.

Material Examined : 12exs,Doddahasala lake, kolar, M.B. Rao, 10.3.78, 1exs, Malker tank, Kolar, M.B. Rao, 3.3.1978, 3exs, Kali river 4 km. from Ganeshgudi supadam, R.M. Sharma, 15.9.1991, 7exs, Koodikunnan, dist. Kolar, M.B. Rao, 10.3.1978, 7exs, Malker tank near. Katarpalem, Dist. Kolar, M.B. Rao, 4.3.1978, 5exs, mashid Basalguntha pond, mulbagal, Dist, Kolar, M.B. Rao, 8.3.1978, 2exs, Vijayapura tank, Dist, Kolar, M.B. Rao, 19.3.1978, 7exs, Srinivasapur tank, Srinivasapura, dist. Kolar, M.B. Rao, 14.3.1978, 7exs, Gavand tank, Siddalghata, Chintamani, dist. Kolar, M.B. Rao,, 15.3.1978, 25exs, Srinivaspura tank, Srinivaspura, dist. Kolar, M.B. Rao, 14.3.1978, 18exs, Abdul Ali Garden, Bangarpet, dist. Kolar, M.B. Rao, 6.3.1978 ; 2 exs., Jayamnagar, Sharavathi River, March 2004, F.8059, Coll. Sreekantha.

Distribution : India : Northern India, (Brahmaputra), also from Western Ghats : Karnataka. Pakistan : Indus river basin.

Remarks : It is a new record for Karanataka.

60. ***Nemacheilus anguilla*** Annandale

1919. *Nemacheilus anguilla* Annandale, *Rec. Indian mus.* **15** : 127 pl.1, fig. 1, (Type-Locality : Yenna River, satara district, Maharashtra)

1987. *Noemacheilus anguilla* Menon, *Fauna of India, Pisces,* vol. **4**(1) : 154, pl. 6, fig. 3.

1999. *Nemacheilus anguilla*, Jayaram, *The Freshwater Fishes of the Indian Region* : 175.

Material Examined : 1ex, Nalla near panja village, Tal. Sullia, P.P. Kulkarni, 8.2.1992; 2 exs., Birer, Sharavathi River, 28.2.2002, F.8063, Coll. Sreekantha.

Distribution : Western Ghats : Maharashtra and Karnataka (Krishna river basin).

Remarks : New report to Karnataka.

61. ***Schistura denisoni denisoni*** (Day)

1867. *Nemacheilus denisoni* Day, *Proc. zool. Soc. Lond.,* 287, (Type-locality : Bhowany River, base of Nilgiris).

1991. *Nemacheilus denisoni denisoni,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 476-477.

1999. *Schistura denisoni denisoni*, Jayaram, *The Freshwater Fishes of the Indian Region* : 181, 188.

Material Examined : 2 exs, Erpu fall, Laxmantirth river, S.G. Patil, 19.9.1990; 9 exs., 26-47 mm S.L., Road to Hassan Dist., Javagal., 30.3.01., F.6789., Coll. G. Thirumalai; 5 exs., 28-55 mm S.L., Road to Mandya, Hassan Dist., 8.4.01., F. 6803., Coll. G.Thirumalai; 3 exs., 29-39 mm.SL., Ghaddehalla, Bannerghatta N.P., 17.3.05, F.7399, Coll. K. Rema Devi; 3 exs., 25-32 mm.SL., madeshpura Koil Kere, 19.3.04, F.7405, Coll. K. Rema devi; 1 ex., 36 mm.SL., Palahalli, Sri Rangapattinam, 14.12.05, F.7838, Coll. S. Prabakaran; 1 ex., 24 mm.SL., Thalasahalli, Srirangapattinam, 14.12.05, F.7862, Coll. S. Prabakaran; 33 exs., 17-38 mm.SL., Napoklu, Thalakavery, 16.9.03, F.7949, Coll. M.S. Ravichandran.

Distribution : Peninsular India, , Madhya pradesh, Maharashtra, Kerala, Tamil Nadu.

62. ***Oreonectes (Oreonectes) evezardi*** Day

1878. *Noemacheilus evezardi* Day, *Fishes of India*, 613, pl. 153, fig. 11. (Type-Locality : Poona).

1987. *Noemachilus evezardi,* Menon, *Fauna of India, Pisces,* vol. **4**(1) : 191-193.

1999. *Oreonectes (Oreonectes) evezardi*, Jayaram, *The Freshwater Fishes of the Indian Region* : 205.

Material Examined : 1ex, Srinivasapur tank, Srinivasapur, dist. Kolar, M.B. Rao, 14.3.1978; 2 exs., 20-33 mm.SL., Medikere, Kodagu Dist., 23.12.05, F.7889, Coll. S. Prabakaran.

Distribution : India : Western Ghats, Krishna and Godavari basins, Satpura range, Panchmari hills.

63. ***Mesonoemacheilus guentheri*** Day

1867. *Noemacheilus guentheri* Day, *Proc. Zool. Soc. Lond.* 285, (Type- Locality : Base of the Nilgiri hills).

1987. *Noemachilus guntheri* Menon, *Fauna of India, Pisces*, vol. **4** : 161, pl. 11, fig. 9.

1999. *Mesonoemacheilus guentheri*, Jayaram, *The Freshwater Fishes of the Indian Region* : 198 & 199.

Material Examined : 1ex, Erpu fall, Laxmantirth River, Nagarhole, S.G. Patil, 19.9.1990.

Distribution : Peninsular India, Western Ghats, Kallar, Pamba, Periyar, Bharatpuzha and Cauvery river systems.

64. ***Schistura denisoni mukambbikaensis*** Menon

1987. *Noemachilus denisoni mukambbikaensis* Menon, *Fauna of India,* Pisces, vol. **4** : 101, pl. 10, fig. 7 (Type locality : Mukambbika, Karnataka).

1999. *Schistura denisoni mukambbikaensis* Jayaram, *The Freshwater Fishes of the Indian Region* : 181 & 188.

Material Examined : 19 exs., 19-41 mm.SL., Doddachempika, Biligiri Rangasamy Temple W.L.S., 25.2.99. F.6856, Coll. G. Thirumalai; 1 ex., 20 mmSL., K. Gudi, BRTWLS, 2.3.99, Coll. S. Krishnan; 1 ex., 24 mm.SL., BRTWLS, Near Ckeck Post, 2.3.99, Coll. S. Krishnan.

Distribution : India : Karnataka : Kollur river and Thalakavery.

65. ***Schistura nilgiriensis*** Menon

1987. *Noemachilus nilgiriensis* Menon, *Fauna of India,* Pisces, vol. **4** : 106, pl.10, fig. 8, 9 & pl. 14, figs 1 & 2 (Type locality : *nr.* Pykara Dam, Nilgiri dt., Tamil Nadu).

1999. *Schistura nilgiriensis* Jayaram, *The Freshwater Fishes of the Indian Region* : 181 & 188.

Material Examined : 11 exs., 18-38 mm.SL., Medikere, 13.11.03, F.7951, Coll. S. Krishnan; 10 exs., 20-44 mm.SL., Thalakavery, 15.11.03, F.7955, Coll. S. Krishnan; 13 exs., 15-30 mm.SL., Thoddasanahalli, 10.9.06, F.7994, Coll. S. Prababakra.

Distribution : India : Pykara Dam, Nilgiri Dist.; Karnataka : Thalakavery.

66. ***Schistura semiarmatus*** Day

1867. *Nemachilus semiarmatus* Day, *Proc. Zool. Soc. Lond.* 286, (Type-Locality : Bowany and Seegoor rivers along the base of the Neilgherry).

1987. *Noemacheilus semiarmatus* Menon, *Fauna of India, Pisces*, vol, **4** : 110, pl.11, figs.1-3 & pl.14, fig. 3.

Material Examined : 1ex, Laxmantirth river, near kutta, Nagarhole, M.S. Pradhan, 2.10.1989; 9 exs., 32-34 mm.SL., Thalakavery, 13.9.06, F.7989, Coll. S. Prabakaran; 2 exs., 30-31 mm.SL., Medikere, 23.12.05, F.7888, Coll. S. Prabakaran; 7 exs., 24-38 mm.SL., Kodagu, 24.12.05, F.7899, Coll. S. Prababkaran; 10 exs., 25-40 mm.SL., Pettikere, 23.12.05, F.7934, Coll. S. Prabakaran; 3 exs., 22-26 mm.SL., Bhagmandala, 13.9.06, F.7979, Coll. S. Prabakran.

Distribution : Peninsular India, Cauvery basin in Wyanad, Nilgiris and Mysore and Silent valley (Bharathapuzha basin).

67. ***Lepidocephalichthys guntea*** (Hamilton)

1822. *Cobitis guntea* Hamilton, *Fishes of Ganges* : 353,394. (Type-Locality : Bengal).

1992. *Lepidocephalus guntea* Menon, *Fauna of India, Pisces*, vol. **4**(2) : 54, pl.IV, fig; fig 1-6, VIII figs, 1&2.

Material Examined : 1ex, Nallah near Murlia village, Tal. Sullia, P.P. Kulkarni, 7.2.1992, 1ex, Malker tank near Katarpalem, Dist. Kolar, M.B. Rao, 4.3.1978, 5exs, Mashid Basalguntha pond, Mulbegal, Dist. Kolar, M.B. Rao, 8.3.1978, 10exs, Srinivasapur tank, Srinivasapur, dist. Kolar, M.B. Rao, 14.3.1978, 14exs, Gavana tank, Siddalghata, Chintamani, dist. Kolar, M.B. Rao, 15.3.1978, 40exs, Srinivasapur tank, Srinivasapur, dist. Kolar, M.B. Rao, 14.3.1978, 6exs, Abdul Ali Garden, Bangarpet, dist. Kolar, M.B. Rao, 6.3.1978.

Distribution : Northern India, Satpura-Vindhyas.

Remarks : It is a new record for Karanataka.

68. ***Lepidocephalichthys thermalis*** (Valenciennes)

1846. *Cobitis thermalis* Valenciennes, *Hist. nat. Poiss.*, **18** : 78 (Type-locality : Malabar).

1991. *Lepidocephalus thermalis,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **1** : 527-528.

Material Examined : 9exs, Yagachi river, Chikmangalure, Mysore, B.K. Tikader, 20.1.1964, 18exs, Sagar, Shimoga Dist, Mysore B.K. Tikader, 10.3.1965, 6exs, Sirsi,Dist. N.Kanara, Mysore, B.K. Tikader 28.2.1965, 2exs, Tunga river, Shimoga, Mysore, Bhimachar, B.S; 6 exs., 30-45 mm S.L., Mysore., April., 2000., Coll. S. Krishnan;1 ex., 50mm S.L., Road to Hassan Dist., Javagal., 30.3.01., F.6795., Coll. G. Thirumalai; 6 exs., 28-35 mm S.L. Bhandur, Hassan Dist., 30.3.01., F. 6798., Coll. G.Thirumalai; 1 ex., 31 mm S.L., Road to Belur, Bhommihalla., 31.3.01., Coll. G. Thirumalai; 2exs. 30-36mm S.L., Road to Hassan to Patna, 3.4.01., Coll. G. Thirumalai; 5 exs., 35-40 mm S.L., Hassan to Kalkere., 24.4.01., F. 6834., Coll. G. Thirumalai; 4 exs., 45-49 mm S.L., Melkoto W.L.S., Bevugal R.F., 10.4.01., F. 6776., Coll. G. Thirumalai; 10 exs., 33-34 mm S.L., Jannapura., 15.6.02., F.7003., Coll. M.B. Raghunathan; 18 exs., 31-35 mm S.L., Kanahathy., 16.6.02., Coll. M.B. Raghunathan; 1 ex., 41mm S.L., Bhadra, Shankargutta., 21.6.02., F. 7024., Coll. M.B. Raghunathan; 1 ex., 25mm S.L., Kadur, 25.6.02., F.7034., Coll. M.B. Raghunathan; 1 ex., 47 mm.SL., Thanganahalli, Tumkur Dsit., 23.9.07, F.8084, Coll. S. Prabakaran; 32 exs., 30-64 mm. SL., Beerandahalli, Kolar Dist., 28.9.07, F. 8085, Coll. S. Prabakaran; 3 exs., 26-29 mm.SL., Byadgi, Haveri dist., 15.9.07, F.8091, Coll. S. Prabakaran; 7 exs., 44-49 mm.SL., Ramasagar, Kolar Dist., 27.9.07, F.8094, Coll. S. Prabakaran; 4 exs., 22-50 mm.SL., 13.9.07, F. 8126, Hallayella, Haveri Dist., Coll. S. Prabakaran; 8 exs., 20-24 mm.SL., 23.9.07, F.8135, Devarayan Durge, Tunkur Dist.,

Coll. S. Prabakaran; 3 exs., 28-37 mm.SL., Kondanjji, Devengere Dist., 17.9.07, F.8142, Kondanjji, Devengere Dist., Coll. S.Prabakaran; 2 exs., 22-30 mm.SL., BRTWLS, near Ckeck Post, 2.3.1999, F.6862, Coll. S.Krishnan; 2 exs., 20-27 mm.SL., Bangalore Dist., 28.12.01, Coll M.B. Raghunathan; 1 ex., 18 mm.SL., Illapalli Kere, 20.12.01, Coll. M.B. Raghunathan; 2 exs., 24-32 mm.SL., Yelhanka, 17.12.01,F.6879, Coll. M.B. Raghunahan; 42 exs., 30-61 mm.SL., Kuduvathi, 15.12.01, F.7077, Coll. M.B. Raghunathan; 13 exs., 38-55 mm.SL., BEML, Township, 22.3.02, F.6909, Coll. S. Krishnan; 10 exs., 33-41 mm.SL., Bage Palli, 28.3.02, F.6913, Coll. S.Krishnan; 4 exs., 35-41 mm.SL., Kambina Halli, 24.3.02, F.6923, Coll. S. Krishnan; 8 exs., 36-47 mm.SL., Holasahalli, 19.3.02, F.6931, Coll. S. Krishnan; 1 ex., 31 mm.SL., Magdi Tank, 18.3.02, Coll. S. Krishnan; 2 exs., 38-39 mm.SL., Jangamkote, 24.3.02, F.6951, Coll. S. Krishnan; 6 exs., 24-26 mm.SL., Arabikothanur, Kolar Dist., 15.3.02, Coll. S. Krishnan; 2 exs., 32.5-45 mm.SL., Mulbagal High Way, Kolar Dist., 22.3.02, F.6976, Coll. S. Krishnan; 1 ex., 36 mm.SL., Gaddhella, Bannerghatta N.P., 15.3.03, F.7295, Coll. S. Krishnan; 1 ex., 32 mm.SL., Udigebandi, Bennarghatta N.P., 16.3.03, F.7303, Coll. S. Krishnan; 2 exs., 35-43 mm.SL., Chickara halli, Bannerghatta N.P., 16.3.03, F.7313, Coll. S. Krishnan; 1 ex., 49 mm.SL., Uruganthottai, 19.3.04, F.7377, Coll. K. Rema Devi; 2 exs., 41-44 mm.SL., Thalebande, 24.3.04, F.7387, Coll. K. Rema Devi; 5 exs., 40-41 mm.SL., Ghaddehalla, 17.3.04, F.7396, Coll. K. Rema Devi; 1 ex., 41 mm.SL., Madeshpura Koil Kere, 19.3.04, F.7404, Coll. K. Rema Devi; 1 ex., 43 mm.SL., Muninagaram, 22.3.04, F.7417, Coll. K. Rema Devi; 6 exs., 47-55 mm.S.L., Jamballa, 10.12.05, F.7830, Coll. S. Prabakaran; 1 ex., 26 mm.SL., Palahalli, Sri Rangapattinam, 14.12.05, F.7839, Coll. S. Prabakaran; 12 exs., 14.5-47 mm.SL., Malenallasandara, Bangalore, 10.12.05, F.7849, Coll. S. Prabakaran; 16 exs., 27-39 mm.SL., Ramasany Canal, Mysore Dist., 17.12.05, F.7858, Coll. S. Prabakaran; 22 exs., 27-36 mm.SL., Sri Rangapattinam, 14.12.05, F.7865, Coll. S. Prabakaran; 3 exs., 24-39 mm.SL., Nanjangud, 15.12.05, F.7870, Coll. S. Prabakaran; 33 exs., 32-35 mm.SL., Appangaro, Medikere, Kodagu, 23.12.05, F.7887, Coll. S. Prabakaran; 3 exs., 18-26 mm.SL., Puttenakunti, 9.12.05, F.7890, Coll. S. Prabakaran; 7 exs., 25-40 mm.SL., Nanjangudi, Kabini River, 15.12.05, F.7895, Coll. S. Prabakaran; 3 exs., 27-28 mm.SL., Chittahalli, Medikere, 24.12.05, F.7901, Coll. S. Prabakaran; 9 exs., 18-41 mm.SL., Balakola Canal, Mysore Dist., 16.12.05, F. 7907, Coll. S. Prabakaran; 7 exs., 31-22 mm.SL., Krishnarajasagar, 16.12.05, F.7920, Coll. S. Prabakaran; 65 exs., 30-36 mm.SL., Medikere, 23.12.05, F.7933, Coll. S. Prabakaran; 12 exs., 18-30 mm.SL., Gabbadi Kere, Bangalore, 11.12.05, F.7939, Coll. S.Prabakaran; 5 exs., 30-38 mm.SL., Mysore near Zoo, 18.12.05, F. 7946, Coll. S. Prabakaran; 1 ex., 39 mm.SL., Farangipet, Mangalore Dist., 18.9.06, F.7964, Coll. S. Prabakaran; 1 ex., 33 mm.SL., Madhavapatna, Coorg Dist., 14.9.06, F.7971, Coll. S.Prabakaran; 4 exs., 28-31 mm.SL., Bhagamandala, Coorg Dist., 13.9.06, F.7980, Coll. S. Prabakaran; 2 exs., 32-34 mm.SL., Thalakavery, 13.9.06, F.7988, Coll. S. Prabakaran; 13 exs., 10-31 mm.SL., Amerahalli Kere, Kolar Dist., 12.12.01, F.6874, Coll. M.B. Raghunathan; 1 ex., Chinkodu, Sharavathi River, 10.1.2004, F.8069, Coll. Sreekantha; 3 exs., Kouthihole , Sharavathi River, Jan 2001, F.8080, Coll. Sreekantha.

Distribution : India : S. India south of Krishna river system.

Elsewhere : Sri Lanka.

69. ***Sperata aor*** (Hamilton)

1822. *Pimelodus aor* Hamilton, *Fishes of Ganges* : 205,379' pl.20, fig.68. (Type-Locality : Rivers of Bengal and upper parts of Gangetic estuary).

1991. *Aorichthys aor,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. 2 : 547-548.

1999. *Sperata aor*, Ferraris & Runge, *Proc. Calif. Acad. Sci.* **51**(1) : 397-424, 8, figs., 7 tables.

Material Examined : 3 exs., 152-165 mm.SL., Bangalore Suburban, 12.3.02, F.6978, Coll. S. Krishnan.

Distribution : India : Ganga, Brahmaputra,

Cauvery, Mahanadi, Narbada, Tapi, Yamuna river systems.

Elsewhere : Bangladesh. Myanmar. Pakistan.

70. ***Batasio sharavatiensis*** Anuradha & Jayaram

2004. *Batasio sharavatiensis* Anuradha & Jayaram, *Zoos' Print* **19** (2) : 1339 (Type Locality : Joginmatha, Sharavati river, Uttara Kannada).

2006. *Batasio sharavatiensis* , Jayaram, *Cat Fishes of India* : 79, 86-87.

Material : 1 ex., Nagodihole, Sharavathi River, 20.5. 2004, F.8072, Coll. Sreekantha.

Distribution : Karnataka : Sharavathi River.

71. ***Mystus cavasius*** (Hamilton)

1822. *Pimelodus cavasius Hamilton*-Buchanan, *Fishes of Ganges* : 203, 379, pl.11, fig. 67 (Type-Locality : Gangetic provinces).

1991. *Mystus cavasius,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries, Vol.* 2 : 559-560.

2006. *Mystus cavasius*, Jayaram, *Cat Fishes of India;* 40 (synonymy, description)

Material Examined : 2exs, Belgaum Dist, Mysore, B.K. Tikader, 11.2.1995 ;3 exs., 108-125 mm. SL., N.R.Pura, 20.6.02, F.7022, Coll. M.B. Raghunathan ; 2 exs., 106-128 mm. SL., N.R. Pura, F.7001, Coll. M.B.Raghunathan.1 ex., 167 mm.SL., 18.9 07, F. 8099, Kondanjji, Devengere Dist., Coll. S. Prabakaran; 2 exs., 118-120 mm.SL., Bangalore, Suburban, 12.3.02, F.6980, Coll. S. Krishnan; 1 ex., 27 mm.SL., F.5646, Nagarwoth, 18.02.98, M.S.R.; 1 ex., Hasaramakki, Sharavathi River, July. 2002, F.8064, Coll. Sreekantha.

Distribution : India.

Elsewhere : Pakistan, Bangladesh, Pakistan, Thailand : Salween basin.

72. ***Mystus montanus*** (Jerdon)

1849. *Bagrus montanus* Jerdon, *Madras Jour. Lit. & Sci.,* **15** (2) : 337 (Type-Locality : Manantoday, Wynaad, Kerala State).

1991. *Mystus montanus,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. 2 : 567-568.

2006. *Mystus montanus*, Jayaram, *Cat Fishes of India;* 49 (synonymy, description).

Material Examined : 5 exs., 44-56 mm.SL., Mysore, April 2000, Coll. S. Krishnan; 1 ex., Road to Hassan, 3.4.01, F.6816, Coll. G. Thirumali; 55 exs., 48-75 mm.SL., Bage Palli, 23.3.02, F.6914, Coll. S. Krishnan; 5 exs., 45-58 mm.SL., Kambina Halli, 24.3.02, F.6924, Colol. S.Krishnan; 4 exs., 74-94 mm.SL., BEML Township, Outer Tank, 22.3.02, F.6920, Coll. S. Krishnan; 17 exs., 41-61 mm.SL., Jangam Kote, 24.3.02, F.6954, Coll. S. Krishnan.

Distribution : India : Hill streams of Kerala, Karnataka, Tamil Nadu, and Madhya Pradesh.

73. ***Mystus vittatus*** (Bloch)

1797. *Silurus vittatus*, Bloch, *Ichthyol.Hist. Nat.,* **11** : 40, pl. 371, fig. 2. (Type-Locality : Tranquebar, S. India)

1991. *Mystus vittatus,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **2** : 573-574.

2006. *Mystus montanus*, Jayaram, *Cat Fishes of India;* 36, 56-57 (synonymy, description).

Material Examined : 6 exs, Near kuppam tank, Bangarpet, dist. Kolar, 25exs, Appayya kunta, chikkalabalapur, dist. Kolar, M.B. Rao, 17.3.1978, 6exs, Srinivaspur tank, Srinivasapur, dist. Kolar, M.B. Rao, 14.3.1978, 14exs, Gavana tank, siddalghata, chintamani dist. Kolar M.B. Rao, 15.3.1978,

Distribution : Throughout India.

Elsewhere : Pakistan, Nepal, Bangladesh, Sri Lnnka, Burma, Thailand.

74. ***Hemibagrus punctatus*** (Jerdon)

1849. *Bagrus punctatus* Jerdon, *Madras Jour. Lit. & Sci.,* **15** (2) : 339, (Type-Locality : Cauvery River, Western Ghats).

1991. *Mystus punctatus,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **2** : 570-571.

2006. *Hemibagrus montanus*, Jayaram, *Cat Fishes of India;* 58, 65-66 (synonymy, description).

Material Examined : 3exs, Berkada stream, Chipkala forest, Nagarhole, G.M. Yazdani, 28.12.1988.

Distribution : India : W. Ghats, Kerala, Tamil Nadu, Karanataka.

75. ***Ompok bimaculatus*** (Bloch)

1797. *Silurus bimaculatus Bloch*, Ichthyol. *Hist. nat. des. Poiss.*, **11** : 17, pl. 364 (Type-Locality : Malabar).

1991. *Ompok bimaculatus,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **II** : 582-583.

2006. *Ompok bimaculatus,* Jayaram, *Cat Fishes of India;* 105 (synonymy, description).

Material Examined : 6 exs., 135-175 mm.SL., Bangalore Suburban, 12.3.02, F.6981, Coll. S.Krishnan; 1 ex., Muppane, Sharavathi River, 22.6. 2004, F.8071, Coll. Sreekantha.

Distribution : Throughout India.

Elsewhere : Bangaladesh. Malaya. Nepal. Pakistan. Sri Lanka. Thailand. Vietnam. Yunnan.

76. ***Ompok pabo*** (Hamilton)

1822. *Silurus pabo* Hamilton, *Fiahes of Ganges* : 153, 375, pl.22, fig. 48 (Type-locality : Brahmaputra River).

1991. *Ompok malabaricus,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **II** : 585-586..

2006. *Ompok malabaricus,* Jayaram, *Cat Fishes of India;* 107 (synonymy, description).

Material : 1 ex., Muppane, Sharavathi River, 22.6. 2004, F.8082, Coll. Sreekantha

Distribution : India : Brahmaputra, Ganga, Yamuna river systems. Now in Cauvery system.

Remarks : The specimen collected by Sreekantha has been tentatively identified as *Ompok pabo* and is a new report to the Cauvery river system.

77. ***Clarias batrachus*** (Linnaeus)

1758. *Silurus batrachus* Linnaeus, *Systema Naturae*, 1, ed 10 : 305 (Type-Locality : Asia and Africa)

1991. *Clarias batrachus,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. 2 : 684-685.

2006. *Clarias batrachus*, Jayaram, *Cat Fishes of India;* 304-305 (synonymy, description).

Material Examined : 1 ex., 325 mm. SL., BEML Township Outer, 22.3.02, F.6902, Coll. S. Krishnan; 1 ex., 235 mm.SL., Ellamalappa Kere, Avalahalli, 15.3.02, F.6948, Coll. S. Krishnan.

Distribution : India.

Elsewhere : ? Bali. Bangladesh, Borneo. Java. Malacca. Malaya. Myanmar. Nepal. Pakistan. Philippines. Singapore. Sri Lanka.Sumatra. Thailand.

78. ***Clarias dussumieri dussumieri*** Valenciennes

1840. *Clarias dussumieri* Valenciennes (in C & V), *Hist. Nat. Poiss.*, **15** : 382, (Type-Locality : Pondicherry, Malabar).

1991. *Clarias dussumieri,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. 2 : 686-687.

2006. *Clarias dussumieri dussumieri*, Jayaram, *Cat Fishes of India;* 304, 307-309 (synonymy, description).

Material Examined : 1ex, Kapinadka Bridge on Dharmasthal Karkala Road, P.P Kulkarni, 12.2.1992, 1ex, Kali river near Erde village puttur, S. Kanara, P.P. Kulkarni, 9.2.1992, 1ex, Halady, S. Kanara, S.S. Kamble, 12.9.1991,

Distribution : Peninsular India (Goa, Karnataka, Kerala and Pondicherry).

79. ***Glyptothorax lonah*** (Sykes)

1838. *Bagrus lonah* sykes, *Proc. zool. Soc. Lond.,* P.164, (Type-Locality : Deccan)

1999. *Glyptothorax lonah* Menon, checklist, *Rec. zool. Surv. India, Occ. paper,* **175** : 245-246.

2006. *Glyptothorax lonah*, Jayaram, *Cat Fishes of India;* 208, 231-233 (synonymy, description).

Material Examined : 1ex., Erpu falls, Laxmantirth river, Nagarhole, S.G. Patil. 10.9.1990,

Distribution : India : Deccah plateau, Godavari & Krishna river systems Vindhya, Orissa hills.

80. ***Heteropneustes fossilis*** (Bloch)

1794. *Silurus fossilis* Bloch, *Naturgesch. Ausl. Fische,* **8** : 46, pl. 370, fig.2 (Type-locality : Tranquebar, Tamil Nadu).

1991. *Heteropneustes fossilis,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **II** : 689-690.

2006. *Heteropneustes fossilis,* Jayaram, *Cat Fishes of India;* 313-316 (synonymy, description).

Material Examined : 10 exs., 62-100 mm. SL., Jangamkote, 24.3.02, F.6952.,6953, Coll. S. Krishnan.

Distribution : India.

Elsewhere : Bangladesh. Laos. Myanmar. Nepal. Pakistan. Sri Lanka. Thailand.

81. ***Rhinomugil corsula*** (Hamilton)

1822. *Mugil corsula* Hamilton-Buchanan, *Fishes of Ganges* : 221, 381, pl. 9, fig. 97 (type- locality : Ganges river).

1991. *Rhinomugil corsula,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **II** : 897-898.

1999. *Rhinomugil corsula,* Jayaram, *The Freshwater Fishes of the Indian Region* : 330-331.

Material Examined : 3 exs., 150-160 mm.SL., Bangalore Suburban, 12.3.02, F.6984, Coll. S. Krishnan.

Distribution : India.

Elsewhere : Bangladesh. Myanmar. Nepal.

82. ***Oryzias setnai*** Kulkarni

1940. *Horaichthys setnai* Kulkarni, *Rec. Indian Mus.*, **42** : 382, (Type-Locality : Navlaki, Kathiwar coast, North and South of Bombay, Maharashtra)

1991. *Horaichthys setnai,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **II** : 746-747.

1999. *Horaichthys setnai,* Jayaram, *The Freshwater Fishes of the Indian Region* : 333 -334.

Material Examined : 2exs, Kupetti River, Tal.Belthangady, P.P. Kulkarni, 11.2.1992

Distribution : India : Backwaters and tanks along the coast about 160 km from Navlahai, Kathiawar coast north and south of Bombay, Maharashtra; Mahad, Kolaba district; Cochin, Valliathurai, Trivandrum. Also recorded from Jhanor, Narbada river, and Kalhor, Bodhan, Tapi river, Gujarat; from Cauvery River, Karnataka.

Remarks : This is a new record to Karnataka.

83. ***Xenentodon cancila*** (Hamilton)

1822. *Esox cancila Hamilton*-Buchanan, *Fishes of Ganges* : 213, 380, pl. 27, fig. 70 (type- locality : Gangetic provinces).

1991. *Xenentodon cancila*, Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **II** : 743-744.

1999. *Xenentodon cancila,* Jayaram, *The Freshwater Fishes of the Indian Region* : 336.

Material : 1 ex., 300 mm.Sl., Gundia River, Nov. 2003, F.7634, Coll M.S. Ravichandra; 1 ex,, Holebagulu, Sharavathi River, 22.4.2004, F.8053, Coll. Sreekantha.

Distribution : India.

Elsewhere : Bangladesh. Myanmar. Nepal. Pakistan : Sind, Punjab.

84. ***Aplocheilus blocki*** (Arnold)

1911. *Haplocheilus panchax* var. *blocki* Arnold, *Wochenschr. Aquarien und Terrarienkunde,* **8** : 672 (Type- locality : Ceylon).

1991. *Aplocheilus blocki*, Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **II** : 750-751.

1999. *Aplocheilus blocki,* Jayaram, *The Freshwater Fishes of the Indian Region* : 343-344.

Material : 2 exs., 24-25 mm.SL., Bhadra Shankar Gutta, 21.6.02, F.7026, Coll. M.B. Raghunathan; 5 exs., 16-25 mm.SL., Kapila nandi near Nanjangud, 3.4.2000, F.6857, Coll. S. Krishnan; 23 exs., 12-27 mm.SL., Addayar, Mangalore Dist., 18.9.06, F.7958, Coll. S. Prabakaran; 3 exs., 16-20 mm.SL., Farangipet, Mangalore Dist., 18.9.06, F.7965, Coll. S. Prabakaran; 3 exs., 14-15 mm.SL., Bellighatta, Dhakshin Kannada, 19.9.06, F.7968, Coll. S. Prabakaran; 12 exs., 8-22 mm.SL., Mangalore Dist., 18.9.06, F.7997, Coll. S. Prabakaran; 2 exs., 24-25 mm.SL., Shankargutta, 21.6.02, F.7026, Coll. M.B. Raghunathan; 3 exs., 27-30 mm. SL., Hallayella, Haveri Dist., 13.9.07, F.8127, Coll. S. Prabakaran; 3 ex.s, Jayanagar, Sharavathi River, March 2004, F.8066, Coll. Sreekantha.

Distribution : India : Gujarat, Karnataka.

85. ***Aplocheilus lineatus*** (Valenciennes)

1846. *Panchax lineatum* Valenciennes, *Hist. nat. Poiss.*, **18** : 381 (Type-locality : Peninsular India).

1991. *Aplocheilus lineatus*, Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **II** : 750,751-752.

1999. *Aplocheilus lineatus,* Jayaram, *The Freshwater Fishes of the Indian Region* : 343-344.

Material Examined : 1ex, Kapinadka Bridge on Dharmasthal Karkala Road, P.P. Kulkarni, 12.2.92, 2exs, Bombar bett 21kms from Karkal, P.P.Kulkarni, 18.2.1992, 1ex, Kupetti River, Tal. Belthangady, P.P. Kulkarni, 11.2.1992, 1ex, Kali river near Erde village Puttur, S. Kanara, P.P. Kulkarni 9.2.1992; 1 ex., 41 mm.SL., Kapilanandi near Nanjagud, 3.4.2000, F.6858, Coll. S. Krishnan; 8 exs., 22-35 mm.SL., Honagodu, 18.6.02, F.7010, Coll. M.B. Raghunathan; 1 ex., 27 mm.SL., Narsipura, 28.3.03, F.7281, Coll. S. Krishnan; 5 exs., 22-35 mm. SL., Nimmar, 26.3.03, F.7330, Coll. S.Krishnan; 1 ex., 29 mm,.SL., Bhagamandala, Coorg Dist., 13.9.06, F.7981, Coll. S. Prabakaran; 1 ex., 26 mm.SL., Thalakavery, Coorg Dist., 13.9.06, F.7990, Coll. S. Prabakaran.

Distribution : India : Western and South-eastern regions : Kodagu, Karntaka, Wynaad, Kerala; Tamil Nadu.

86. ***Aplocheilus panchax*** (Hamilton)

1822. *Esox panchax* Hamilton, *Fishes of Ganges*, pp. 211, 380, pl.3 fig.69, (Type- Locality : Bengal).

1991. *Aplocheilus lineatus*,Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **II** : 750, 752-753.

1999. *Aplocheilus panchax* Menon, Checklist, *Rec. zool. Surv. India, Occ. Paper*, **175** : 269.

Material Examined : 15exs, Srinivasapur, tank, srinivasapur, dist. Kolar, M.B. Rao, 14.3.1978, 5exs, water works tank srinivasapur, dist. Kolar, M.B. Rao, 14.3.78, 22exs, Nalla, Moroli village, mangalore, S.kanara, Mysore, B.K. Tikader, 6.2.1964; 46 exs., 19-41 mm.SL., Kanava Reservoir, 16.3.02, F.6966, Coll. S. Krishnan; 1 ex., 20 mm.SL., Jambala, 10.12.05, F.7832, Coll. S. Prabakaran.

Distribution : India : Andaman Islands,Orissa, W.Bengal.

Elsewhere : Bangladesh. Malay Archipelago. Myanmar. Pakistan. Thailand.

87. ***Gambusia affinis*** (Baird & Girard)

1853. *Heterandria affinis* Baird and Girard, *Proc. Acad. nat. Sci. Philad.*, **6** : 390 (type-Locality : San Antanio river drainage, Texas).

1991. *Gambusia affinis*, Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **II** : 756-757.

1999. *Gambusia affinis,* Jayaram, *The Freshwater Fishes of the Indian Region* : 344-345.

Material Examined : 40.exs, Gopal tank, Chikkaballapur, dist. Kolar, M.B. Rao, 19.3.1978, 4exs, Malker tank, kolar, M.B. Rao, 3.3.1978, 30exs, Malker tank near katarpalem dist. Kolar, M.B. Rao, 4.3.1978; 39 exs., 18-37 mm.SL., Mysore, April 2000, Coll. S.Krishnan; 1 ex., 30 mm.SL., Kapila Nandi, near Nanjagud, 3.4.01, F.6859, Coll. S. Krishnan; 57 exs., 18-33 mmSL., Melkoto W.L.S., Bevugal R.F., 10.4.01, F.6779, Coll.G.Thirumalai; 28 exs., 12-27 mm.SL., Kanathy, 16.6.02, Coll. M.B. Raghunathan; 10 exs., 16-30 mm. SL ., Kadur, 25.6.02, F.7035, Coll. M.B. Raghunathan; 1 ex., 20 mm.SL., Jodithimmapura, 22.3.03, Coll. S. Krishnan.;301 exs., 11.5-39 mm.SL., Road to Hassan Dist., Javagal, 30.3.01, F.6790, Coll. G. Thirumalai; 170 exs., 11-30 mm.SL., Road to Mandya, 8.4.01, F.6805, Coll. G. Thirumalai; 105 exs., 14-29 mm.SL., Road to Hassan to Patna, 3.4.01, F.6815, Coll. G. Thirumalai,; 4 exs., 17-27 mmSL., Road to Hassan, Karkuntha, 30.3.01, Coll. G. Thirumalai; 35 exs., 14-35 mm. SL., Road to Hassan to Karkuntha, 30.3.01, F.6831, Coll. G. Thirumalai; 23 exs., 15-30 mm. SL., Hassan to Kalkere, 24.4.01, F.6835, Coll. G.Thirumalai ; 290 exs., 11-29 mm.SL., Ramasagar, Kolar Dist., 27.9.07, F.8095, Coll. S. Prabakaran; 76 exs., 11-40 mm.SL., Basavanathahalli, Kolarkere, 13.12.01, F.6868, Coll. M.B.Raghunathan; 2 exs., 17-19 mm.SL., Ulsoor Tank, Bangalore, 12.3.02, Coll. S. Krishnan; 4 exs., 30-36 mm.SL., BEML, Town ship, 22.3.02, F.6908, Coll. S. Krishnan; 15 exs., 8.5-32 mm.SL., Kambinahalli, 24.3.02, F.6925, Coll. S. Krishnan; 22 exs., 18-31 mm.SL., Holasahalli, 19.3.02, F.6932, Coll. S. Krishnan; 6 exs., 18.5-31.5 mm.SL., Jangamkote, 24.3.02, F.6956, Coll. S. Krishnan; 4 exs., 19.5-32 mm.SL., Narasapura, Kolar Dist., 15.3.02, F.6970, Coll. S.

Krishnan; 45 exs., 13.5-30 mm., SL., Kombalagodu, Bangalore Rural, 14.3.02, F.6974, Coll. S. Krishnan; 231 exs., 11 -30 mm.SL., Near ramaamypond, 13.9.03, F.7353, Coll. G. Thirumalai; 200 exs., 15-30 mm.SL., Jodukonta, 16.3.04, F.7401, Coll. K. Rema Devi; 2 exs., 12-13 mm.SL., Madeshpura Koil Tank, 19.3.04, Coll. K. Rema Devi; 1 ex., 30 mm.SL., Palahalli, Srirangapattinam, 14.12.05, F.7837, Coll. S. Prabakaran; 3 exs., 20-26 mm.SL., Seenapanthotti, Chamaraj Dist., 20.12.05, F.7845, Coll. S. Prabakaran; 11 exs., 16.5-25 mm.SL., Malenallasandra, Bangalore Dist., 10.12.05, F.7850, Coll. S. Prabakaran; 7 exs., 21-36 mm.SL., Ramasamy Canal, Mysore Dist., 17.12.05, Coll. S. Prabakaran; 37 exs., 15-31 mm.SL., Srirangapattinam, 14.12.05, F.7864, Coll. S. Prabakaran; 42 exs., 16-34 mm.SL., Nanjangudi, 15.12.05, F.7871, Coll. S.Prabakaran; 16 exs., 26-38 mm.SL., Poodhipadiga, Chamarajnagar Dist., 20.12.05, F. 7876, Coll. S.Prabakaran; 1 ex., 18 mm.SL., Puttenakunti, 9.12.05, Coll. S. Prabakaran; 32 exs., 15-27 mm.SL., Balakola Canal, Mysore Dist., 16.12.05, F.7908, Coll. S. Prabakarn; 18 exs., 18-31 mm.SL., Krishnarajasagar, 16.12.05, F.7918, Coll. S. Prabakaran; 29 exs., 18-33 mm.SL., Kachanayakanahalli, Hassan Dist., 27.12.05, F.7924, Coll. S. Prabakaran; 3 exs., 16-24 mm.SL., Gevenahalli, Hassan dist., 28.12.05, Coll. S. Prabakaran; 1 ex., 24 mm.SL., Thimmanahalli, Hassan Dist., 28.12.05, Coll. S. Prabakaran; 1 ex., 25 mm.SL., Madavapattanm, Coorg Dist., 14.9.06, F.7972, Coll. S. Prabakaran.

Distribution : Native of coastal waters of United States from New Jersey to Florida and adjoining gulf drainages in Central Americal southwards. Widely introduced in India.

88. ***Poeclia reticulata*** Peters

1859. *Poeclia reticulata* Peters, *K. Preussischen Akad. Wiss., Berlin* : 412 (Type-Locality : Venezuela)

1991. *Poecilia (Lebistes) reticulata*, Talwar & Jhingran, Inland fishes, vol. **2** : 758-759.

1999. *Poeclia reticulata,* Jayaram, *The Freshwater Fishes of the Indian Region* : 345-346.

Material Examined : 5exs, Sulkeri river 12 km. from Karkala on Belthangady Road, P.P. Kulkarni, 17.2.1992, 8exs, Malker tank near Katarpalem, Dist. Kolar, M.B.Rao, 4.3.1978; 10exs, Srinivasapur tank, Srinivasapur, dist.Kolar, M.B. Rao, 14.3.1978;123 exs., 9-24 mm.SL., Road to Hassan Karkuntha, 30.3.01, F.6808, Coll. G. Thirumalai; 8 exs., 16-25 mm.SL., Melkoto W.L.S., Bevugal R.F., 10.4.01, F.6780, Coll. G. Thirumalai;13 exs., 14-24 mm.SL., Jannapura, 15.6.02, Coll. M.B. Raghunathan; 5 exs., 14-33 mm.SL., Vastara, 21.3.03, F.7320, Coll. S. Krishnan; 72 exs., 12-30 mm.SL., Byadgi, Haveri Dist., 15.9.07, F.8090, Coll. S. Prabakaran; 228 exs., 15-35 mm.SL., Hallayella, Haveri Dist., 13.9.07, F.8123, Coll. S. Prabakaran; 117 exs., 14-25 mm.SL., Devarayana Durge, Tumkur Dist., 23.9.07, F. 8137, Coll. S. Prabakaran; 101 exs., 16-30 mm.SL., Kondajji, Devengere Dist., 17.9.07, F.8143, Coll. S. Prabakaran; 33 exs., 14-25 mm.SL., Biligiri Rangaswamy W.L.S., 7 Km. From K. Gudi, 24.2.99, F.6861, Coll. S. Krishnan; 24 exs., 13-20 mm.SL., BRTWLS, Near Check Post, 2.3.99, F.6863, Coll. S. Krishnan; 730 exs., 10-24 mm.SL., Bangalore Dist., 28.12. 01, F.6867, Coll. M.B. Raghunathan; 188 exs., 8-28 mm.SL., Kondapalli, 16.12.01, F.6870, Coll. M.B. Raghunathan; 290 exs., 9-22 mm.SL., Illapalli Kere, 20.12.01, F.6871, Coll. M.B. Raghunathan; 34 exs., 13-27 mm.SL., Amerahalli Kere, 12.12.01, F.6875, Coll. M.B. Raghunathan; 103 exs., 9-30 mm.SL., Yelhanka, Kolar, 17.12.01, F.6881, Coll. M.B. Raghunathan; 21 exs., 13-22 mm.SL., Hosuhuddia Halli Road, Kolar, 20.12.01, F. 6882, Coll. M.B. Raghunathan; 74 exs., 12-33 mm.SL., Mallasandra Kere, Kolar, 21.12.01, F.6883, Coll. M.B. Raghunathan; 38 exs., 15-31 mm.SL., Kuduvathi, 15.12.01, F.7078, Coll. M.B. Raghunathan; 256 exs., 7.5-29 mm.SL., Chitamani, 23.3.02, F.6960, Coll. S. Krishnan; 18 exs., 18-30 mm.SL., Mulbagal High Way, Kolar, 22.3.02, F.6977, Coll. S. Krishnan; 2 exs., Bannerghatta N.P., Mooleygundi, 15.3.03, F.7286, Coll. S. Krishnan, 1 ex., 22 mm.SL., Thattekere, 18.3.03, Coll. S. Krishnan; 1 ex., 18 mm.SL., Udigebandi bannerghatta N.P., 16.3.03, F.7305, Coll. S. Krishnan; 4 exs., 16-24 mm.SL., Muthyala

Maduvu, 15.9.03, F.7351, Coll. G.Thirumalai; 1 ex., 15 mm.SL., Ebella, 14.9.03, Coll. G. Thirumalai; 734 exs., Gollahalleselu, Bannerghatta N.P., 20.3.04, F.7359 , Coll. K. Rema devi; 21 exs., 12-35 mm.SL., Uruganthottai, 19.3.04, F.7380, Coll. K. Rema Devi; 371 exs., 8-19 mm.SL., Sebenekere, 16.3.04, F.7381, Coll. K. Rema devi; 18 exs., 11-21 mm.SL., Bettahalli Kavalu, 23.3.04, Coll. K. Rema Devi; 13 exs., 15-30 mm.SL., Ghaddehalla, 17.3.04, F.7400, Coll. K. Rema Devi; 23 exs., 14-34 mm.SL., Muthyala Maduvu, 20.3.04, F.7410, Coll. K.Rema Devi; 56 exs., 15-37 mm.SL., Jamballa, 10.12.05, F.7831, Coll. S. Prabakaran; 50 exs., 16-36 mm.SL., Malenallasandra, 10.12.05, F.7851, Coll. S. Prabakaran; 3 exs., 15-20 mm.SL., Chittahalli, Medikere, 24.12.05, F.7900, Coll. S. Prabakaran; 7 exs., 10-23 mm.SL., Gabbadi Kere, Bangalore Dist., 11.12.05, F.7942, Coll. S. Prabakaran; 20 exs., 10-20 mm.SL., Uttegu Seegudi, Chikmagalur Dist., F.7993, Coll. S. Prabakaran;

Distribution : Originally from Tropical America. Introduced into India.

89. ***Mastacembelus armatus*** (Lacepede)

1800. *Macrognathus armatus* Lacepede, *Hist. nat. Poiss.*, **2** : 286 (Type-locality : Not known).

1991. *Mastacembelus armatus* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **II** : 1031-1032.

1999. *Mastacembelus armatus,* Jayaram, *The Freshwater Fishes of the Indian Region* : 359-360.

Material Examined : 2exs, Nalla near panja village, Tal. Sullia, P.P. Kulkarni, 8.2.1992, 2exs, Kali river near Erde village Puttur, S.Karana, P.P. Kulkarni, 9.2.1992; 1 ex., 105 mm.SL., Mysore, April 2000, Coll. S. Krishnan; 2 exs., 160-188 mm.SL., Melkote W.L.S., Bevugal R.F., 10.4.01, F.6784, Coll. G. Thirumalai; 1 ex., 303 mm.SL., N.R. Pura, 20.6.02, F.7028, Coll. M.B. Raghunathan; 1 ex., 315 mm.SL., Bangalore, 12.3.02, F.6982, Coll. S. Krishnan; 1 ex., 59 mm.SL., Nanjangud, 15.12.05, F.7872, Coll. S. Prabakaran; 2 exs., 64-95 mm.SL., Balakola Canal, 16.12.05, F.7911, Coll. S. Prabakaran.

Distribution : Throughout India.

Elsewhere : Bangladesh. S.China. Hainan Island. Java. Malaya. Myanmar. Nepal. Pakistan. Sri Lanka. Sumatra. Thailand. Tonkin. Vietnam.

90. ***Macrognathus pancalus*** (Hamilton)

1822. *Mastacembelus pancalus* Hamilton, *Fishes of Ganges,* 30, 364, pl. 22,, fig. 7. (Type-Locality : Tanks of Gangetic Provinces)

1991. *Mastacembelus pancalus* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **II** : 1027-1028.

1999. *Mastacembelus pancalus,* Jayaram, *The Freshwater Fishes of the Indian Region* : 358.

Material Examined : 1ex, Dharamsthala, S.S. Kamble, 5.9.1991, 1ex, Kali river Erde village Puttur, S. Kanara, P.P. Kulkarni, 9.2.1992,

Distribution : India. Pakistan, Bangladesh.

91. ***Pseudosphromenus cupanus*** (Valenciennes)

1831. *Polyacanthus cupanus* Valenciennes, *Hist. nat. poiss.*, **7** : 357. (Type-Locality : Ariancoupan river at Pondicherry)

1991. *Macropodus cupanus*, Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **II** : 1002-1003.

1999. *Pseudosphromenus cupanus,* Jayaram, *The Freshwater Fishes of the Indian Region* : 438-439.

Material Examined : 4exs, Nalla moroli village, Mangalore, S.Kanara, Mysore, B.K. Tikader, 6.2.1964, 1ex, Sagar, dist. Shimoga, Mysore, B.K. Tikader, 10.3.1965; 1 ex., 32 mm.SL., Honagodu, 18.6.02, F.7011, Coll. M.B. Raghunathan; 14 exs., 28-30 mm. SL., Sringeri, Agumbe, 19.6.02, F.7015, Coll. M.B. Raghunathan; 1 ex., 29 mm.SL., Bhadra, Shankaragutta, 21.6.02, F.7025, Cool. M.B. Raghunathan ; 40 exs., 24-33 mm.SL., Doddannakere, Bannerghatta N.P., 15.3.04, F.7358, Coll. K. Rema Devi; 5 exs., 19-20 mm.SL., Addayar, Mangalore Dist., 18.9.06, F.7959, Coll. S. Prabakaran; 7 exs., 17-39 mm.SL., Farangipet, Mangalore Dist., 18.9.06, F. 7966, Coll. S. Prabakaran; 2 exs., 20-24 mm.SL., Mangalore Dist., 18.9.06, F.7996, Coll. S. Prabakaran.

Distribution : India : Kerala, Maharashtra, Karnataka and Coromandel coasts.

Elsewhere : Bangladesh. Pakistan. Sri Lanka.

92. ***Chanda nama*** Hamilton

1822. *Chanda nama* Hamilton-Buchanan, *Fishes of Ganges* : 109, 371, pl.39, fig.37 (Type-locality : Ponds throughout Bengal).

1991. *Chanda nama,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **II** : 799-800.

1999. *Chanda nama*, Jayaram, *The Freshwater Fishes of the Indian Region* : 369.

Material Examined : 3exs, Dharamsthala, S.S. Kamble, 5.9.1991, 1ex, stream near Belthagdi, S.S. Kamble, 5.9.1991; 1 ex., 40 mm.SL., Melkote W.L.S., Bevugal, R.F., 10.4.01, F.6782, Coll. G. Thirumalai; 241 exs., 22-45 mm.SL., Road to Hassan Dist., 30.3.01, F.6791, Coll. G.Thirumalai; 20 exs., 25-47 mm.SL., Javagal, 30.3.01, F.6794, Coll. G. Thirumalai; 198 exs., 24-35.5 mm.SL., Road to Mandya, 8.4.01, F.6806, Coll. G. Thirumalai; 1 ex., 27 mm. SL., Jodithimmapur, 22.3.03 ,F.7273, Coll. S. Krishnan; 9 exs., 23-30 mm.SL., Vastara, 21.3.03, F.7321, Coll. S. Krishnan 1 ex., 44 mm.SL., Ramasagar, Kolar Dist., 27.9.07, F.8096, Coll. S. Prabakaran; 3 exs., 31-32 mm.SL., Hallayella, Haveri Dist., 13.9.07, F.8125, Coll. S. Prabakaran; 11 exs., 24-45 mm.SL., Kondajji, Devengere Dist., 17.9.07, F.8140, Coll. S.Prabakaran; 97 exs., 26-43 mm.SL., Thattekere, Bannerghatta N.P., 18.3.03, F. 7291, Coll. S. Krishnan; 127 exs., 20-29 mm.SL., Matheswara Kere, Bannerghatta N.P., 14.9.03, F.7345, Coll. G. Thirumalai; 20 exs., 17-35 mm.SL., Medshpura Koil Kere, Bannerghatta N.P. , 19.3.04, F.7407, Coll. K. Rema Devi; 1 ex., 25 mm.SL., Thalasahalli, Srirangapattinam, 14.12.05, F.7868, Coll. S. Prabakaran; 1 ex., 32 mm.SL., Kachanayakanahalli, Hassan Dist., 27.12.05, F.7926, Coll. S. Prabakaran; 1 ex., 28 mm.SL., Gevenahalli, Hassan Dist., 28.12.05, F.7937, Coll. S. Prabakaran; 2 exs., 28-29 mm.SL., Thimmanahalli, Hassan Dist., 28.12.05, F.7941, Coll. S. Prabakaran.

Distribution : Throughout India.

Elsewhere : Pakistan. Bangladesh. Nepal.

93. ***Pseudamassis ranga*** (Hamilton)

1822. *Chanda ranga* Hamilton-Buchanan, Fishes *of Ganges* : 113, 371, pl.16, fig.38 (type-locality : freshwaters of all parts of Gangetic Provinces)

1991. *Pseudambassis ranga,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **II** : 805-806.

1999. *Paeudambassis ranga*, Jayaram, *The Freshwater Fishes of the Indian Region* : 370-371.

Material Examined : 23 exs., 30-47 mm. SL., Melkote W.L.S. Bevugal R.F., 10.4.01, F.6783, Coll. G. Thirumalai; 5 exs., 37-46 mm.SL., Road to Hassan Dist., Javagal, 30.3.01, F.6792, Coll. G. Thirumalai; 10 exs., 32.5-42 mm. SL., Road to Mandya, 8.4.01, F.6807, Coll. G. Thirumalai; 3 exs., 55-61 mm.SL., Mysore, April, 2000, Coll S. Krishnan; 8 exs., 40-42 mm.SL., Matheswara Kere, Bannerghatta N.P., 14.9.03, F.7342, Coll. G. Thirumalai; 1 ex., Holebagilu, Sharavathy River, Jan. 2003, F.8045, Coll. Sreekantha et.al.

94. ***Pristolepis marginata*** (Jerdon)

1848. *Pristolepis marginatus Jerdon, Madras J. Lit. & Sci.,* **15** : 141 (Type-locality Mananthavady river, North Malabar).

1991. *Pristolepis marginata,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **II** : 881.

1999. *Pristolepis marginata*, Jayaram, *The Freshwater Fishes of the Indian Region* : 396.

Material Examined : 1ex, Subramanyam, S.S. Kamble, 12.9.1991.

Distribution : India : Wyanaad, Kerala; Anamalai Hills, Tamil Nadu.

Remarks : This species has been reported for the first time from Karnataka (Rema Devi *et.al.*, 2000).

95. ***Etroplus maculatus*** (Bloch)

1785. *Chaetodon maculatus Bloch, Syst. Ichth.,* : pl. 427, fig.2 (type-locality : India).

1991. *Etroplus maculatus,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **II** : 885.

1999. *Etroplus maculatus*, Jayaram, *The Freshwater Fishes of the Indian Region* : 399.

Material Examined : 1 ex., 22 mm. SL, Addayar, Mangalore, 18.9.06, F.7960, Coll. S. Prabkaran.

Distribution : India : Tamil Nadu, Kerala, Karnataka.

Elsewhere : Sri Lanka.

96. ***Etroplus suratensis*** (Bloch)

1785. *Etroplus suratensis* Bloch, *Syst. Ichth.* : pl. 217 (type-locality : ? Surat.).

1991. *Etroplus suratensis,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **II** : 885-886.

1999. *Etroplus suratensis*, Jayaram, *The Freshwater Fishes of the Indian Region* : 399.

Material Examined : 1 ex., 102 mm.SL., Bangalore Suburbun, 12.3.02, F.6979, Coll. S. Krishnan; 2 exs., 110-120 mm.SL., Netravathi River 20 Km. away from Arabian Sea, 28.11.03, F.7616, Coll. M.S. Ravichandran.

Distribution : Peninsular India : Tamil Nadu, Andhra Pradesh, Orissa, Kerala, Karnataka.

Elsewhere : Sri Lanka.

97. ***Oreochromis mossambica*** (Peters)

1852. *Chromis (Tilapia) mossambicus* Peters, *Montab. Akad. Wiss., Berlin* : 681 (Type-Locality : Mozambique).

1991. *Oreochromis mossambica,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. II : 887-888.

1999. *Oreochromis mossambica*, Jayaram, *The Freshwater Fishes of the Indian Region* : 400.

Material Examined : 1ex, Nethravati river, pane Mangalore dist. S. Kanara, S.S. Kamble, 29.8.1999; 3 exs., 27-30 mm.SL., Mysore, April, 2000, Coll. S. Krishnan; 7 exs., 23-55 mm.SL., River Cauvery behind SR Patna, 7.4.01, F.6837, Coll. G.Thirumalai; 2 exs., 18-18.5 mm.SL., Jannapur, 15/6/02, Coll. M.B. Raghunathan; 3 exs., 15-18 mm.SL., Near village Road, 27.6.02, Coll. M.B. Raghunathan; 1 ex., 15.5 mm.SL., Narsipura, 28.3.03, Coll. S. Krishnan; 96 exs., 20-48 mm. SL., Road to Hassan Dist., 30.3.01, F.6793, Coll. G. Thirumalai; 59 exs., 11-11.5 mm.SL., Road to Mandya, 8.4.01, F.6809, Coll. G. Thirumalai; 1 ex., 16 mm.SL., Road to Hassan, Karkuntha, 30.3.01, Coll. G. Thirumalai 108 exs., 11-82 mm.SL., Byadgi, Haveri Dist., 15.9.07, F.8089, Coll. S. Prabakaran; 40 exs., 22-115 mm.SL. Ramasagar, Kolar Dist., 27.9.07, F.8097, Coll. S. Prabakaran; 10 exs., 77-88 mm.SL., Kondajji, Davengere Dist., 18.9 07, F.8106, Coll. S. Prabakaran; 3 exs., 20-55 mm.SL., Devarayan Durge, Tumkur Dist., 23.9.07, F.8136, Coll. S. Prabakaran; 1 ex., 27 mm.SL., Kondajji, Devengere Dist., 17.9.07, , Coll. S. Prabakaran; 1 ex., 14 mm.SL., Doddachempika, B.R.T.W.L.S., 25.2.99, Coll. S. Krishnan; 265 exs., 6-36 mm.SL., Basvanathahalli, Kolarkere, 13.12.01, F. 6869, Coll. M.B. Raghunathan; 9 exs., 18-27 mm.SL., Yelhanka, Bangalore, 17.12.01, F.6880, Coll. M.B. Raghunathan; 5 exs., 5-111 mm.SL., Ulsoor Tank, Bangalore, 12.3.02, F.6889, Coll. S.Krishnan; 22 exs., 41-96 mm.SL., Uyyampalli, 17.3.02, F.6893, Coll. S. Krishnan; 44 exs., 30-65 mm.SL., Khajikalla halli, Kolar Dist., 15.3.02, F.6896, Coll. S. Krishnan; 8 exs., 45-130 mm.Sl., Munganahalli, 23.3.02, F.6901, Coll. S.Krishnan; 52 exs., 20-98 mm.SL., BEML, Township, 22.3.02, F.6910, Coll. S.Krishnan; 2 exs., 145-146 mm.SL., Hunganoor, 19.3.02, F.6911, Coll. S. Krishnan; 6 exs., 46-140 mm.SL., Munganahalli, 23.3.02, F.6928, Coll. S. Krishnan; 5 exs., 14-27.5 mm.SL., Holasahalli, 19.3.02, Coll. S.Krishnan; 240 exs., 14-113 mm.SL., Naickarpalya, 18.3.02, F.6934, Coll. S. Krishnan; 18 exs., 16-73 mm.SL., Magdi tank, Bangalore, 18.3.02, F.6940, Coll. S. Krishnan; 1 ex., 44 mm.SL., Uyyampalli, 17.3.02, Coll. S. Krishnan; 22 exs., 35-68 mm.SL., Bannerghatta, Bangalore, 12.3.02, F.6946, Coll. S. Krishnan; 4 exs., 124-140 mm.SL., Ellamalappa Kere, Avalahalli, 15.3.02, F.6947, Coll. S. Krishnan; 14 exs., 35-69 mm.SL., Jangamkote, 24.3.02, F.6959, Coll. S. Krishnan; 1 ex., 38 mm.SL., Narasapura, Kolar Dist., 15.3.02, Coll. S.Krishnan; 1 ex., 25 mm.SL., Mooleygudi, 15.3.03, F.7287, Coll. S. Krishnan; 7 exs., 98-127 mm.SL., Thattekere, 18.3.03, F.7292, Coll. S.Krishnan; 4 exs., 21-46 mm.SL., Gaddhella, 15.3.03, F.7297, Coll. S. Krishnan; 9 exs., 57-125 mm.SL., Matheswara kere, 14.9.03, F.7343, Coll. G.Thirumalai; 4 exs., 15-26 mm.SL., Near ramasamy Pond, 13.9.03, Coll. G. Thirumalai; 16 exs., 22-32 mm.SL.,

Doddannakere, 15.3.04, F>7357, Coll. K. Rema Devi; 155 exs., 14-110 mm.SL., Uruganthottai, 19.3.04, F.7374, Coll. K. Rema Devi; 23 exs., 8-19 mm.SL., Sebenekere, 16.3.04, Coll. K. Rema Devi; 43 exs., 18-78 mm.SL., Ghaddehalla, 17.3.04, F.7397, Coll. K.Rema Devi; 1 ex., 15 mm.SL., Jodukontu, 16.3.04, F.7394, Coll. K. Rema Devi; 38 exs., 10-35 mm.SL., Madeshpura Koil Kere, 19.3.04, F.7406, Coll. K.Rema Devi; 13 exs., 38-78 mm.SL., Muninagaram, 22.3.04, F.7418, Coll. K. Rema Devi; 4 exs., 29-30 mm.SL., Palahalli, Srirangapattinam, 14.12.05, F.7840, Coll. S. Prabakaran; 68 exs., 18-40 mm.SL., Seenapanthotti, Chamraj Dist., 20.12.05, F.7846, Coll. S. Prabakaran; 1 ex., 19 mm.SL., Ramasany Canal, 17.12.05, Coll. S. Prabakaran; 1 ex., 25 mm.SL., Thalasahalli, Srirangapattinam, 14.12.05, Coll. S. Prabakaran; 39 exs., 17-31 mm.SL., Poodhipadiga, Chamarajnagar Dist., 20.12.05, F.7877, Coll. S. Prabakaran; 5 exs., 15-24 mm.SL., Balakola, Mysore Dist., 16.12.05, Coll. S. Prabakaran; 2 exs., 23-36 mm.SL., Krishnarajasagar, 16.12.05, F.7919, Coll. S. Prabakaran; 4 exs., 23-32 mm.SL., Kachanayakanahalli, Hassan Dist., 27.12.05, F.7927, Coll. S. Prabakaran; 1 ex., 15 mm.SL., Addayar, Mangalore Dist., 18.9.06, Coll. S. Prabakaran.

Distribution : East Africa to Natal, Widely introduced in India.

Elsewhere : Bangladesh. Pakistan. Sri Lanka.

98. ***Glossogobius giuris*** (Hamilton)

1822. *Gobius giuris* Hamilton-Buchanan, *Fishes of Ganges* : 51, pl.33, fig.15 (Type-locality : Gangetic provinces).

1991. *Glossogobius giuris,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **II** : 936.

1999. *Glossogobius giuris*, Jayaram, *The Freshwater Fishes of the Indian Region* : 413-414.

Material Examined : 6exs, Kali river, 4kms from Ganeshgudi Supadam, R.M. Shama, 15.9.1991; 31 exs., 30-70 mm.SL., Melkote W.L.S., Bevugal R.F., 10.4.01, F.6781, Coll. G. Thirumalai 26 exs., 27-64 mm.SL., Ramasagar, Kolar Dist., 27.9.07, F.8098 , Coll. S. Prabakaran; 1 ex., 66 mm. SL., Kondanjji, Davengere Dist., 18.9.07, F.8104, Coll. S. Prabakaran; 3 exs., 5-81 mm.SL., Hanumanth Nagar, Bangalore dist., 17.3.02, F.6895, Coll. S. Krishnan; 1 ex., 44 mm.SL., Uyyampalli, 17.3.02, F.6944, Coll. S. Krishnan; 1 ex., 79 mm.SL., Kanva Reservoir, 16.3.02, F.6964, Coll. S. Krishnan; 1 ex., 53 mm.SL., Poodhipadiga, Chamarajanagar Dist., 20.12.05, F.7875, Coll. S.Prabakaran; 1 ex., 19 mm.SL., Balakola Canal, Mysore Dist., 16.12.05, Coll. S.Prabakaran; 1 ex., 30 mm.SL., Kacnanaya Kanahalli, Hassan Dist., 27.12.05, F.7925, Coll. S. Prabakaran; 4 exs., 22-36 mm.SL., Thalasahalli, Srirangapattinam, 14.12.05, F.7867, Coll. S. Prabakaran; 1 ex., Muppane, Sharavathi River, March 2004, F.8058, Coll. Sreekantha.

Distribution : Throughout India.

Elsewhere : Bangladesh. Myanmar. Nepal. Pakistan. Sri Lanka. It has a wide range of distribution from the East coast of Africa to Japan, Australia and South Pacific.

99. ***Redigobius romeri*** (Weber)

1911. *Gobius romeri* Weber, *Abh. Senckenb. Naturf. Ges.,* 34, p. 39, fig. 8.

1911. *Redigobius romeri*, Kottelat, M. et.al. *Freshwater Fishes of Western Indonesia and Sulawesi,* Periplus Editions (HK) Ltd. pp. 219, Pls. 84.

Material Examined : 6exs, 26.5-29.0 mm SL., Kukki, Subramania, Kallagi, 15.4.1999, F.6136 Coll. G.Thirumalai; 1 ex., 24 mm.SL., Seedhanadhi, Karnataka, 27.2.2002, F.7363 , Coll. Arunachalam and Party.

Distribution : Sulawesi, Moluccas, New Guinea, Philippines, Fiji, Australia, India.

Remarks : This species has been reported for the first time from the mainland of India (Rema Devi & Indra, 2005).

100. ***Anabas testudineus*** (Bloch)

1795. *Anabas testudineus* Bloch, *Nat. Aus. Fish.,* (6) : 121, pl.322, (Type-Locality : Mentioned as Japan but it doesn't occur in Japan)

1991. *Anabas testudineus,* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries,* Vol. **II** : 996-998.

1999. *Anabas testudineus,* Jayaram, *The Freshwater Fishes of the Indian Region* : 434-435.

Material Examined : 3 exs, Kapinadka Bridge on Dharmasthala, Karkalla Road, P.P. Kulkarni, 12.2.1992, 10exs, Kupetti River, Tal. Betthangady, P.P. Kulkarni, 11.2.1992,

Distribution : Throughout India.

Elsewhere : Bangladesh. Borneo. Malay Archipelago. Myanmar. Philippines. Singapore. Sri Lanka.

101. ***Channa gachua*** (Bloch & Schneider)

1801. *Channa orientalis* Bloch and Schneider, *Syst. Ichth.* : 496, pl. 90. fig. 2 (Type-Locality : India).

1991. *Channa orientalis,* Talwar and Jhingran, *Inland Fishes of India and adjacent Countries,* Vol. **II** : 1019-1020.d

1999. *Channa orientalis,* Jayaram, *The Freshwater Fishes of the Indian Region* : 446-447

Material Examined : 5 exs, Sulkeri river 12 km. from Karkala on Belthangady Road, P.P. Kulkarni, 17.2.1992, 5exs, Bombar bett 21 Kms from Karkala, P.P. Kulkarni, 18.2.1992, 1ex, Dharamsthala, S.S. Kanble, 5.9.1991, 5exs, Kupetti river, Tal. Belthangady, P.P. Kulkarni, 11.2.1992, 2exs, Nallah near panja village, Tal. Sullia, P.P. Kulkarni, 8.2.1992, 2exs, Nallah near muralia village, Tal. Sullia, P.P. Kulkarni, 7.2.1992, 1ex, Kali river near Erde village puttur, S. Kanara, P.P. Kulkarni, 9.2.1992, 10exs, mashid Basalguntha pond, mulbagal, Dist. Kolar, M.B. Rao, 8.3.1978, 1ex, Gavana tank, Siddalghata, Chintamani, dist. Kolar, M.B. Rao, 15.3.1978, 8exs, Srinivasapur tank, Srinivasapur, dist. Kolar, M.B. Rao, 14.3.1978, 1ex, Belgaum Dist, Mysore, B.K. Tikader, 11.2.1965; 1 ex., 78 mm.SL., Mysore April 2000, Coll.S.Krishnan; 5 exs., 54-120 mm. SL., Honagodu, 18.6.02, F.7012, Coll. M.B. Raghunathan; 1 ex., 64 mm.SL., Korakkanahalli, 26.3.03, F.7335, Coll. S. Krishnan; 3 exs., 95-110 mm.SL., Uthigabande, Bannerghatta N.P., 18.3.04, F.7365, Coll. K. Rema Devi; 1 ex., 64 mm.SL., Balakola Canal, Mysore Dist., 16.12.05, F.7909, Coll. S.Prabakaran; 1 ex., 58 mm.SL., Bhagamandala, Coorg Dist., 13.9.06, F.7982, Coll. S. Prabakaran.

Distribution : Throughout India.

Elsewhere : Afghanistan. Bangladesh. Borneo. Iran. Malaysia. Myanmar. Nepal. Pakistan. Sri Lanka. Thailand.

102. ***Channa marulius*** (Hamilton)

1822. *Ophiocephallus marulius* Hamilton, *Fishes of Ganges*; 65, 367, pl. 17, fig. 9. (Type-Locality : River Ganges).

1991. *Channa marulius,* Talwar and Jhingran, *Inland Fishes of India and adjacent Countries,* Vol. **II** : 1017-1018.

1999. *Channa orientalis,* Jayaram, *The Freshwater Fishes of the Indian Region* : 446-447.

Material Examined : 1ex, Nethravati river, Pane Mangalore dist. S. Kanara, S.S. Kamble, 29.8.1991.

Distribution : Throughout India. Bangladesh. China. Myanmar. Pakistan. Sri Lanka. Thailand.

103. ***Channa punctatus*** (Bloch)

1794. *Ophiocephalus punctatus* Bloch, *Natur Aus. Fische,* **7** : 139, pl. 358. (Type-Locality : Coromandal coast)

1991. *Channa punctatus,* Talwar and Jhingran, *Inland Fishes of India and adjacent Countries,* Vol. **II** : 1020-1021.

1999. *Channa punctatus,* Jayaram, *The Freshwater Fishes of the Indian Region* : 446-447.

Material Examined : 1ex, Appayya kunta, Chikkaballapur, dist. Kolar, M.B. Rao, 17.3.1978, 1ex, Srinivasapur tank, Srinivasapur, dist. Kolar, M.B. Rao, 14.3.1978, 2exs, Bada Talab, mullagal, dist. Kolar, M.B. Rao, 9.3.1978, 1ex, Sirsi, N. Kanara, Mysore, B.K. Tikader, 28.2.1965; 11 exs., 17-31 mm.SL., Kadur, 25.6.02, F.7036, Coll. M.B. Raghunathan; 58 exs., 17-58 mm.SL., Road to Hassan to Patna, 3.4.01, F.6817, Coll. G. Thirumalai; 1 ex., 120 mm.SL., Road to Hassan, Karkuntha, 30.3.01, F.6823, Coll. G. Thirumalai; 3 exs., 49-71 mm.SL., Road to Hassan, Karkuntha, 30.3.01, F6830, Coll. G.Thirumala. 27exs., 18-125 mm.SL., Kuduvathi, 15.12.01, F.7079, Coll. M.B. Raghunathan; 7 exs., 56-110 mm.SL., Hunumanth Nagar, 17.3.02, F.6894, Coll. S. Krishnan; 2 exs., 35-56 mm.SL., Magdi Tank,

Bangalore, 18.3.02, F. 6939, Coll. S. Krishnan; 1 ex., 39 mm.SL., Uyyampalli, 17.3.02, F.6945, Coll. S. Krishnan; 1 ex., 46 mm.SL., Jangam Kote, 24.3.02, F.6955, Coll. S.Krishnan; 1 ex., 65 mm.SL., Kanva Reservoir, 16.3.02, F.6965, Coll. S. Krishnan; 1 ex., 178 mm.SL., Suburbun Bangalore, 12.3.02, F.6983, Coll. S. Krishnan; 2 exs., 55-56 mm.SL., Muthyala Maduvu, Bannerghatta N.P., 15.9.03, F.7352, Coll. G. Thirumalai; 46 exs., (Juv.), 18-22 mm.SL., Athikupae Halli, Bannerghatta N.P., 17.9.03, F.7354, Coll. G.Thirumalai; 1 ex., 21 mm.SL., Malenallasandra, Bangalore, 10.12.05, Coll. S. Prabakaran; 17 exs., 40-70 mm SL., Kachanayakanahalli, Hassan Dist., 27.12.05, F.7928, Coll. S. Prabakaran.

Distribution : Throughout India.

Elsewhere : Afghanistan. Bangladesh. China. Malaya. Myanmar. Nepal. Pakistan. Polynesia. Sri Lanka.

104. ***Tetraodon (Monotretus) travancoricus*** Hora and Nair

1941. *Tetraodon (Monotretus) travancoricus* Hora and Nair, *Rec. Indian Mus.*, **43**(3) : 391, figs. 3 & 4 (Type-locality : Pamba river at Travancore).

1991. *Tetraodon travancoricus,* Talwar and Jhingran, *Inland Fishes of India and adjacent Countries,* Vol. **II** : 1061-1062.

1999. *Tetraodon travancoricus,* Jayaram, *The Freshwater Fishes of the Indian Region* : 449-450.

Material Examined : 10 exs, 10-18.5 mm SL., Mavincar, Dakshin Kannada, 13.4.1999, F.5845, Coll. G. Thirumalai.

Distribution : India : In fresh waters along the Coastal belt of Kerala and Karnataka.

Remarks : This species has been reported for the first time from Karnataka (Rema Devi, Indra & Raghunathan, 2000).

SUMMARY

Earlier reports on the fishes of Karnataka to mention a few important work include Hora (1937), Bhimachar and Subba Rau (1941), Chacko and Kuriyan (1948), David (1963), David *et al.* (1969, 1974). Rahman (1978), Rajagopal *et al.* (1978), Jayaram *et al.* (1982) and Raghunathan (1989). Most recently Chandrashekhariah *et.al.* (2000) have given a detailed account the ichthyofauna of Karnataka state listing 97 species from Cauvery River, 101 from Krishna River and 60 species from Godavary River. Subsequently new distributional records have been reported by Rema Devi *et al.* (2000 a, 2000 b, 2005), Rema Devi and Indra (2005) and Krishnan *et al.* (2004) which include the following additions to the fish fauna of Karnataka viz. *Esomus thermoicos* (Val.), *Rasbora labiosa* Mukerjee, *Pristolepis marginatus* Jerdon, *Tetraodon (Monotretus) travancoricus* (Hora and Nair) and *Redigobius romeri* (Weber) and more recently *Barilius barna* (Hamilton) and *Ompok pabo* (Hamilton). Additional new records to Karnataka reported in this paper have been reported by WRS and are *Puntius fasciatus pradhani* Tilak, *Puntius phutunio* (Hamilton), *Crossocheilus latius latius* (Hamilton), *Acanthocobitis botia* (Hamilton), *Lepidocephalus guntea* (Hamilton), *Horaichthys setnai* Kulkarni. One specimen answering to the description of *Tor neilli* a rare species, earlier considered a synonym of *Tor khudree,* was collected and is reported here.

To sum up this paper reports 213 species, with 104 species actually collected and detailed here, with additional 13 new reports and one rare species from Karnataka . Of the 213 species listed 86 species are endemic to the Western Ghats and 13 endemic to the state.

ACKNOWLEDGEMENTS

The authors are thankful to the Director, Zoological Survey of India and the Officer's-in-Charge, Southern Regional Station and Western Regional Station for the facilities provided.

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Fauna of Karnataka, State Fauna Series, **21** : 277-387, 2013

MARINE AND ESTUARINE FISH

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INTRODUCTION

Karnataka state is endowed with vast marine and fresh water resources. This maritime state has about 300 km long coast line between 12°42′25″ -14°57′20″ N and 74°02′25″-74°53′20″ E. The continental shelf of the state has an area of 27,000 sq. km and the exclusive economic zone (EEZ) of 87,000 sq. km, besides 8,000 ha of brackish water area in its coastal zone. The shelf of Karnataka has an average width of 80 km and the depth of shelf break is between 90 and 120 meters. The geographical area of Karnataka is 192,204 sq. km which is about 5.85% of the total area of the Indian Union. The State lies between the latitudes 11°12′ N and 18°12′ N and longitudes 73°48′ E and 78°18′ E. It has a moderate climate with four seasons and receives an annual average rainfall of 120 cm.

Karnataka, formerly known as the State of Mysore, is the eighth largest State in India in terms of area and population. This state has 29 districts; out of which 3 are coastal districts, *i.e.*, Uttar Kannada, Udupi and Daskhin Kannada. The state has three principal geographical zones: the coastal region of Karavali, the hilly Malenadu region comprising the Western Ghats and the Bayaluseeme region comprising the plains of the Deccan plateau. It has one of the most indented shoreline with numerous river mouths, lagoons, bays, creeks, cliffs, spits, sand dunes and long beaches. There are 14 west flowing rivers draining into the Arabian Sea. The important estuaries include the Netravati-Gurpur, Gangolli, Hangarkatta, Sharavathi, Aghanashini, Gangavali and Kalinadi. Sand bars have developed in most of the estuaries. There are a number of barrier spits at Tannirbavi, Sasithitlu, Udyavara, Hoode, Hangarkatta and Kirimanjeswara formed due to migration of coastal rivers.

The Karnataka State is located on the western edge of the Deccan plateau and is surrounded by Maharashtra and Goa on the north, Andhra Pradesh on the east, Tamil Nadu and Kerala on the south. On the western side of the State is the Arabian Sea. This maritime state, with its 300 km long coastline, rich continental shelf and vast EEZ, has a resource potential of 4.25 lakh tonnes of marine fish production per annum. The State is endowed with 5.03 lakh hectares of freshwater resources with a good potential for fish production. Besides this, the State has 8000 ha of brackishwater area. The present fish production of the State is around 2.90 lakh tonnes. Karnataka has the highest number of mechanised boats with 6,318 crafts operating in inshore waters. The marine fish production in the inshore waters has almost reached saturation point and further attention is required to exploit the offshore and deep-sea resources. The Karnataka coast, usually known as the mackerel coast, shows decline in fish production during last decade.

The marine fish production potential is estimated at around 4.25 lakh M.T. per annum. Prior to introduction of mechanical fishing crafts and gear, marine fish landings were around 0.18 lakh M.T. per annum. With the introduction of

mechanized trawlers for harvesting bottom dwelling fishes, purse seines for pelagic fishes and gill netters for mid water species, the fish landing recorded a high of 2.23 lakh M.T. (1996-97) in a span of about 22 years (1964-1996). In subsequent years, there was gradual decline in fish catches and a low of 1.28 lakh M.T. was recorded in 2001-2002.

Marine fishing in this sate is almost restricted to the near shore areas. The oil sardines and mackerels are the dominant fishes among the total fish landings in this state. The state contributes about 10% of the total marine fish production in India. In Karnataka, mackerals, sardines, anchovics and other clupeoids form the dominent pelagic fishing while catfishes, sciaenids, perches, sharks and rays etc. constitute the deep sea fishing. Soles and prawns form the major demersal fishery.

There are 29 fish landing centers including five minor fishing harbors in the State. To overcome crowding of fishing vessels in these harbors and to assist smaller mechanized boat operators and traditional fishermen, constructions of fish landing jetties have been taken up at intermediate centers. Though the State has vast inland water resources, most of them are rain fed and thereby the water holding capacity depends on good monsoon. Besides there is heavy siltation of these water bodies, reducing the overall effective water spread area. However, attempt has been made to develop all suitable resources resulting in increased inland fish production in recent years. The State has a leasing policy for inland water bodies categorizing them based on water spread areas and fixing priorities while leasing. The fishery rights of water bodies not leased out are disposed of by tender-cum-auction. Supply of quality fish seed as a stocking material being a pre-requisite for intensive development, greater attention is given for fish seed production including assistance to private entrepreneurs to establish fish seed production and rearing farms. The fish seed production is around 200 million in terms of fry. As per the ad hoc survey conducted by the State Agriculture Department, about 9.91 lakh hectares of land has become saline, alkaline or water-logged, especially in the command areas of the major irrigation projects, due to continuous irrigation and has become unfit for cultivation. These lands have facility to draw copious water from the adjacent canals and can be utilized for aquaculture by correcting the soil and water quality. The State Government is implementing a scheme to encourage farmers to take up fish culture in these waterlogged areas. The State Government is implementing several of the centrally sponsored schemes and State plan schemes with the main object of augmenting fish production. The emphasis is on the improvement of socio-economic condition of the fisher folk. Attention is also given towards providing infrastructural facilities and marketing of fish.

The 300 km. long coast line of this state has been surveyed covering almost all the major fish landing centers. The present work is the outcome of our exploration for the marine and estuarine fishes of all the 3 coastal districts of Karnataka, in addition to the fishes already known to occur in this state as per the published literature. In all, 570 species under 128 families and 30 orders has been included in this present work from this state. A brief description of all the families, along with key to the orders, families, genera and species has been furnished in this study. Remarks or systematic notes on some species are also included in this work. The 'key to the species' provided hereunder is applicable to the species reported from Karnataka coast only. The literature consulted during this study has been included in the bibliography section of this work. The arrangement of orders and families are mostly in accordance with Nelson (2006).

SYSTEMATIC LIST

CLASS CHONDRICHTHYES

Order I ORECTOLOBIFORMES

Family 1 HEMISCYLIDAE

1. *Chiloscyllium arabicum* Gubanov, 1980
2. *Chiloscyllium griseum* Muller & Henle, 1838

3. *Chiloscyllium indicum* (Gmelin, 1789)

Family 2 STEGOSTOMATIDAE

4. *Stegostoma fasciatum* (Hermann, 1783)

Family 3 GYNGLIMOSTOMATIDAE

5. *Nebrius ferugineus* (Lesson, 1830)

Family 4 RHINCODONTIDAE

6. *Rhincodon typus* Smith, 1828

Order II LAMNIFORMES

Family 5 ALOPIDAE

7. *Alopias pelagicus* Nakamura, 1935
8. *Alopias vulpinus* (Bonnaterre, 1788)

Family 6 ODONTASPIDAE

9. *Carcharias taurus* Rafinesque, 1810

Family 7 LAMNIDAE

10. *Isurus oxyrinchus* Rafinesque, 1810

Order III CARCHARHINIFORMES

Family 8 SCYLIORHINIDAE

11. *Atelomycterus marmoratus* (Bennett, 1830)
12. *Halaelurus quagga* (Alcock, 1899)

Family 9 TRIAKIDAE

13. *Iago omanensis* (Norman, 1939)
14. *Mustelus mosis* Hemprich & Ehrenberg, 1899

Family 10 HEMIGALEIDAE

15. *Chaenogaleus macrostomus* (Bleeker, 1852)
16. *Hemipristis elongata* (Klunzinger, 1871)

Family 11 CARCHARHINIDAE

17. *Carcharhinus amblyrhynchoides* (Whitley, 1934)
18. *Carcharhinus dussumieri* (Muller & Henle, 1839)
19. *Carcharhinus hemiodon* (Valenciennes, 1839)
20. *Carcharhinus limbatus* (Muller & Henle, 1839)
21. *Carcharhinus longimanus* (Poey, 1861)
22. *Carcharhinus leucas* (Valenciennes, 1839)
23. *Carcharhinus macloti* (Muller & Henle, 1839)
24. *Carcharhinus melanopterus* (Quoy & Gaimard)
25. *Carcharhinus sorrah* (Muller & Henle, 1839)
26. *Galeocerdo cuvieri* (Peron & LeSueur, 1839)
27. *Lamiopsis temminckii* (Muller & Henle, 1839)
28. *Loxodon macrorhinus* Muller & Henle, 1839
29. *Negaprion acutidens* (Ruppell, 1837)
30. *Prionace glauca* (Linnaeus, 1758)
31. *Rhizoprionodon acutus* (Ruppell, 1837)
32. *Rhizoprionodon oligolinx* Springer, 1964
33. *Scoliodon laticaudus* (Muller & Henle, 1841)

Family 12 SPHYRNIDAE

34. *Eusphyra blochii* (Cuvier, 1816)
35. *Sphyrna lewini* (Griffith & Smith, 1834)
36. *Sphyrna mokarran* (Ruppell, 1837)
37. *Sphyrna zygaena* (Linnaeus, 1758)

Order IV SQUALIFORMES

Family 13 SQUALIDAE

38. *Squalus mitsukurii* Jordan & Snyder, 1903

Order V PRISTIFORMES

Family 14 PRISTIDAE

39. *Anoxypristis cuspidata* (Latham, 1794)

Order VI TORPEDINIFORMES

Family 15 NARCINIDAE

40. *Narke dipterygia* (Bloch & Schneider, 1801)

Order VII RAJIFORMES

Family 16 RHINOBATIDAE

41. *Glaucostegus grannulatus* (Cuvier, 1829)
42. *Rhynchobatus djiddensis* (Forsskal, 1775)

Order VIII: MYLIOBATIFORMES

Family 17 DASYATIDAE

43. *Dasyatis zugei* (Muller & Henle, 1841)
44. *Himantura bleekeri* (Blyth, 1860)
45. *Himantura uarnak* (Forsskal, 1775)
46. *Pastinachus sephen* (Forsskal, 1775)
47. *Urogymnus asperrimus* (Bloch & Schneider, 1801)

Family 18 GYMNURIDAE

48. *Gymnura poecilura* (Shaw, 1804)

Family 19 MYLIOBATIDAE

49. *Aetobatus narinari* (Euphrasen, 1790)
50. *Aetomylaeus maculatus* (Gray, 1834)
51. *Aetomylaeus nichofii* (Bloch & Schneider, 1801)
52. *Rhinoptera javanica* Muller & Henle, 1841
53. *Mobula eregoodootenkee* (Bleeker, 1859)

Class OSTEICHTHYES

Order IX ELOPIFORMES

Family 20 ELOPIDAE

54. *Elops machnata* (Forsskal, 1775)

Family 21 MEGALOPIDAE

55. *Megalops cyprinoides* (Broussonet, 1782)

Order X ALBULIFORMES

Family 22 ALBULIDAE

56. *Albula vulpes* (Linnaeus, 1758)

OrderXI ANGUILLIFORMES

Family 23 ANGUILLIDAE

57. *Anguilla bengalensis bengalensis* (Gray, 1834)
58. *Anguilla bicolor bicolor* (McClelland, 1844)

Family 24 MURAENIDAE

59. *Echidna nebulosa* (Ahl, 1789)
60. *Gymnothorax meleagris* Schultz, 1953
61. *Gymnothorax pictus* (Ahl, 1789)
62. *Gymnothorax pseudothyrsoideus* (Bleeker, 1852)
63. *Strophidon sathete* (Hamilton, 1822)

Family 25 CONGRIDAE

64. *Uroconger lepturus* (Richardson, 1845)

Family 26 MURAENESOCIDAE

65. *Congresox talabonoides* (Bleeker, 1853)
66. *Muraenesox bagio* (Hamilton, 1822)
67. *Muraenesox cinereus* (Forsskal, 1775)

Family 27 OPHICHTHIDAE

68. *Lamnostoma orientalis* (McClelland, 1844)
69. *Neenchelys buitendijki* Weber & de Beaufort, 1916

Order XII CLUPEIFORMES

Family 28 CLUPEIDAE

70. *Amblygaster leiogaster* (Valenciennes, 1847)
71. *Amblygaster sirm* (Walbaum, 1792)
72. *Anodontostoma chacunda* (Hamilton, 1822)
73. *Dussumieria acuta* Valenciennes, 1847
74. *Dussumieria elopsoides* Bleeker, 1849
75. *Escualosa thoracata* (Valenciennes, 1847)
76. *Herklotsichthys quadrimaculatus* (Ruppell, 1837)
77. *Hilsa kelee* (Cuvier, 1829)
78. *Nematalosa galatheae* Nelson & Rothman, 1973
79. *Nematalosa nasus* (Bloch, 1795)
80. *Sardinella albella* (Valenciennes, 1847)
81. *Sardinella fimbriata* (Valenciennes, 1847)
82. *Sardinella gibbosa* (Bleeker, 1849)
83. *Sardinella jusieu* (Lacepede, 1803)
84. *Sardinella longiceps* Valenciennes, 1847
85. *Sardinella melanura* (Cuvier, 1829)
86. *Spartelloides delicatulus* (Bennett, 1832)
87. *Spartelloides gracilis* (Temminck & Schlegel, 1846)
88. *Tenualosa ilisha* (Hamilton, 1822)
89. *Tenualosa toli* (Valenciennes, 1847)

Family 29 PRISTIGASTERIDAE

90. *Ilisha elongata* ([Bennett], 1830)
91. *Ilisha filigera* (Valenciennes, 1847)
92. *Ilisha megaloptera* (Swainson, 1839)
93. *Ilisha melastoma* (Bloch & Schneider, 1801)
94. *Ilisha sirishai* Seshagiri Rao, 1975
95. *Ilisha striatula* Wongratana, 1983
96. *Opisthopterus tardoore* (Cuvier, 1829)
97. *Pellona ditchela* Valenciennes, 1847
98. *Raconda russeliana* Gray, 1831

Family 30 ENGRAULIDAE

99. *Coilia dussumieri* Valenciennes, 1848

100. *Coilia neglecta* Whitehead, 1967
101. *Encrasicholina devisi* (Whitley, 1940)
102. *Encrasicholina puntifer* Fowler, 1938
103. *Stlephorus commersonnii* Lacepede, 1803
104. *Stolephorus indicus* (van Hasselt, 1823)
105. *Stolephorus insularis* Hardenberg, 1933
106. *Stolephorus waitei* Jordan and Seale, 1926
107. *Thryssa dayi* Wongratana, 1983
108. *Thryssa dussumieri* (Valenciennes, 1848)
109. *Thryssa hamiltonii* Gray, 1835
110. *Thryssa malabarica* (Bloch, 1795)
111. *Thryssa mystax* (Bloch & Schneider, 1801)
112. *Thryssa polybranchialis* Wongratana, 1983
113. *Thryssa purava* (Hamilton, 1822)
114. *Thryssa setirostris* (Broussonet, 1782)
115. *Thryssa vitrirostris* (Gilchrist & Thompson, 1908)

Family 31 CHIROCENTRIDAE

116. *Chirocentrus dorab* (Forsskal, 1775)
117. *Chirocentrus nudus* Swainson, 1839

Order XIII GONORYNCHIFORMES

Family 32 CHANIDAE

118. *Chanos chanos* (Forsskal, 1775)

Order XIV SILURIFORMES

Family 33 PLOTOSIDAE

119. *Plotosus canius* Hamilton, 1822
120. *Plotosus limbatus* Valenciennes, 1840
121. *Plotosus lineatus* (Thunberg, 1787)

Family 34 ARIIDAE

122. *Arius arius* (Hamilton, 1822)
123. *Arius jella* Day, 1877
124. *Arius maculatus* (Thunberg, 1792)
125. *Arius subrostratus* Valenciennes, 1840
126. *Arius sumatranus* ([Bennett], 1830)
127. *Batracocephalus mino* (Hamilton, 1822)
128. *Hemiarius sona* (Hamilton, 1822)
129. *Hexanematichthys sagor* (Hamilton, 1822)
130. *Nemapteryx caelata* (Valenciennes, 1840)
131. *Netuma thalassina* (Ruppell, 1837)
132. *Osteogeneiosus militaris* (Linnaeus, 1758)
133. *Plicofollis dussumieri* (Valenciennes, 1840)
134. *Plicofollis platystomus* (Day, 1877)
135. *Plicofollis tenuispinis* (Day, 1877)
136. *Plicofollis tonggol* (Bleeker, 1846)

Order XV AULOPIFORMES

Family 35 CHLOROPHTHALMIDAE

137. *Chlorophthalmus agassizi* Bonnaparte, 1840
138. *Chlorophthalmus bicornis* Norman, 1939

Family 36 SYNODONTIDAE

139. *Harpadon nehereus* (Hamilton, 1822)
140. *Saurida micropectoralis* Shindo & Yamada, 1972
141. *Saurida tumbil* (Bloch, 1795)
142. *Saurida undosquamis* (Richardson, 1848)
143. *Saurida wanieso* Shindo &Yamada, 1972
144. *Synodus engelmani* Schultz, 1953
145. *Synodus indicus* (Day, 1873)
146. *Synodus variegates* (Lacepède, 1803)
147. *Trachinocephalus myops* (Forster, 1801)

Order XVI MICTOPHIFORMES

Family 37 MICTOPHIDAE

148. *Diaphus dumerilli* (Bleeker, 1856)

Order XVII GADIFORMES

Family 38 BREGMACEROTIDAE

149. *Bregmaceros mcclellandi* Thompson, 1840

Family 39 MACROURIDAE

150. *Malacocephalus laevis* (Lowe, 1843)

Order XVIII OPHIDIIFORMES

Family 40 OPHIDIIDAE

151. *Brotula multibarbata* Temminck & Schlegel, 1846

Order XIX BATRACHIDIFORMES

Family 41 BATRACHOIDIDAE

152. *Allenbatrachus grunniens* (Linnaeus, 1758)
153. *Colletteichthys dussumieri* (Valenciennes, 1837)

Order XX LOPHIIFORMES

Family 42 LOPHIIDAE

154. *Lophiodes mutilus* (Alcock, 1894)
155. *Lophiomus setigerus* (Vahl, 1797)

Order XXI MUGILIFORMES

Family 43 MUGILIDAE

156. *Liza macrolepis* (Smith, 1849)
157. *Liza melinoptera* (Valenciennes, 1836)
158. *Liza parsia* (Hamilton, 1822)
159. *Liza subviridis* (Valenciennes, 1836)
160. *Liza planiceps* (Valenciennes, 1836)
161. *Liza vaigiensis* (Quoy & Gaimard, 1825)
162. *Mugil cephalus* Linnaeus, 1758
163. *Valamugil cunnesius* (Valenciennes, 1836)
164. *Valamugil seheli* (Forsskal, 1775)
165. *Valamugil speigleri* (Bleeker, 1858)

Order XXII BELONIFORMES

Family 44 EXOCOETIDAE

166. *Cheilopogon cyanopterus* (Valenciennes, 1847)
167. *Cheilopogon furcatus* (Mitchill, 1815)
168. *Cheilopogon nigricans* (Bennett, 1840)
169. *Cheilopogon suttoni* (Whitley & Colefax, 1938)
170. *Cypselurus naresii* (Gunther, 1889)
171. *Cypselurus poecilopterus* (Valenciennes, 1847)
172. *Exocoetus monocirrhus* Richardson, 1846
173. *Exocoetus volitans* Linnaeus, 1758
174. *Hirundichthys coromandelensis* (Hornell, 1923)
175. *Parexocoetus brachypterus* (Richardson, 1846)
176. *Parexocoetus mento* (Valenciennes, 1847)
177. *Prognichthys brevipinnis* (Valenciennes, 1847)

Family 45 HEMIRAMPHIDAE

178. *Hemiramphus archipelagicus* Collete & Parin, 1978
179. *Hemiramphus far* (Forsskal, 1775)
180. *Hyporhamphus dussumieri* (Valenciennes, 1847)
181. *Hyporhamphus limbatus* (Valenciennes, 1847)
182. *Hyporhamphus quoyi* (Valenciennes, 1847)
183. *Hyporhamphus xanthopterus* (Valenciennes, 1847)
184. *Rhynchorhamphus georgii* (Valenciennes, 1847)
185. *Zenarchopterus dispar* (Valenciennes, 1847)

Family 46 BELONIDAE

186. *Ablennes hians* (Valenciennes, 1846)
187. *Strongylura leiura* (Bleeker, 1850)
188. *Strongylura strongylura* (van Hasselt, 1823)
189. *Tylosurus acus melanotus* (Bleeker, 1850)
190. *Tylosurus crocodilus crocodilus* (Peron & Lesueur, 1821)

Order XXIII ATHERINIFORMES

Family 47 ATHERINIDAE

191. *Atherinomorus duodecimalis* (Valenciennes, 1835)
192. *Atherinomorus lacunosus* (Forster, 1801)
193. *Hypoatherina temminkii* (Bleeker, 1853)

Order XXIV BERYCIFORMES

Family 48 HOLOCENTRIDAE

194. *Sargocentron rubrum* (Forsskal, 1775)

Family 49 BERYCIDAE

195. *Beryx decadactylus* Cuvier, 1829
196. *Beryx splendens* Lowe, 1834

Order XXV ZEIFORMES

Family 50 PARAZENIDAE

197. *Cyttopsis rosea* (Lowe, 1843)

Family 51 ZEIDAE

198. *Zenopsis conchifer* (Lowe, 1852)

Order XXVI SYNGNATHIFORMES

Family 52 FISTULARIIDAE

199. *Fistularia petimba* Lacepede, 1803

Family 53 AULOSTOMIIDAE

200. *Aulostomus chinensis* (Linnaeus, 1766)

Family 54 MACRORHAMPHOSIDAE

201. *Macrorhamphosus gracilis* (Lowe, 1839)

Family 55 SYNGNATHIDAE

202. *Hippocampus kuda* Bleeker, 1852

Order XXVII SCORPAENIFORMES

Family 56 DACTYLOPTERIDAE

203. *Dactyloptena macracantha* (Bleeker, 1854)
204. *Dactyloptena orientalis* (Cuvier, 1829)

Family 57 APISTIDAE

205. *Apistus carinatus* (Bloch & Schneider, 1801)

Family 58 SCORPAENIDAE

206. *Pterois russelii* Bennett, 1831
207. *Pterois volitans* (Linnaeus, 1758)

Family 59 TETRAROGIDAE

208. *Pseudovespicula dracaena* (Cuvier, 1829)

Family 60 SYNANCIIDAE

209. *Choridactylus multibarbus* Richardson, 1848
210. *Minous monodactylus* (Bloch & Schneider, 1801)
211. *Synanceia verrucosa* Bloch & Schneider, 1801

Family 61 SETARCHIDAE

212. *Setarches guentheri* Johnson, 1862

Family 62 TRIGLIDAE

213. *Lepidotrigla faurei* Gilchrist & Thompson, 1914
214. *Lepidotrigla omanensis* Regan, 1905

Family 63 PLATYCEPHALIDAE

215. *Cociella crocodilus* (Tilesius, 1812)
216. *Grammoplites scaber* (Linnaeus, 1758)
217. *Grammoplites suppositus* (Troschel, 1840)
218. *Kumococius rodericensis* (Cuvier, 1829) ..
219. *Platycephalus indicus* (Linnaeus, 1758)
220. *Rogadius asper* (Cuvier, 1829)
221. *Rogadius melanopterus* (Knapp & Wongratana, 1987)

Order XXVIII PERCIFORMES

Family 64 AMBASSIDAE

222. *Ambassis ambassis* (Lacepede, 1802)
223. *Ambassis dussumieri* Cuvier, 1828
224. *Ambassis gymnocephalus* (Lacepede, 1802)
225. *Chanda nama* Hamilton, 1822
226. *Parambassis ranga* (Hamilton, 1822)
227. *Parambassis thomassi* (Day, 1870)

Family 65 LATIDAE

228. *Lates calcarifer* (Bloch, 1790)

Family 66 ACROPOMATIDAE

229. *Acropoma japonicum* Gunther, 1859

Family 67 SERRANIDAE

230. *Cephalopholis boenak* (Bloch, 1790)
231. *Cephalopholis formosa* (Shaw, 1812)
232. *Epinephelus aerolatus* (Forsskal, 1775)
233. *Epinephelus bleekeri* (Vaillant, 1878)
234. *Epinephelus chabaudi* (Castlenau, 1861)
235. ?*Epinephelus chlorostigma* (Valenciennes, 1828)
236. *Epinephelus coioides* (Hamilton, 1822)
237. *Epinephelus diacanthus* (Valenciennes, 1828)
238. *Epinephelus epistictus* (Temminck & Schlegel, 1842)
239. *Epinephelus erythrurus* (Valenciennes, 1828)
240. *Epinepghelus fasciatus* (Forsskal, 1775)
241. *Epinephelus faveatus* (Valenciennes, 1828)
242. *Epinephelus fuscoguttatus* (Forsskal, 1775)
243. *Epinephelus lanceolatus* (Bloch, 1790)
244. *Epinephelus latifasciatus* (Temminck & Schlegel, 1842)
245. *Epinephelus malabaricus* (Bloch & Schneider, 1801)
246. *Epinephelus polylepis* Randall & Heemstra, 1991
247. ?*Epinephelus stoliczkae* (Day, 1875)
248. *Epinephelus undulosus* (Quoy & Gaimard, 1824)

Family 68 PRIACANTHIDAE

249. *Heteropriacanthus cruentatus* (Lacepède, 1801)

250. *Priacanthus hamrur* (Forsskal, 1775)
251. *Priacanthus tayenus* Richardson, 1846

Family 69 APOGONIDAE

252. *Apogon endekataenia* Bleeker, 1852
253. *Cheilodipterus quinquelineatus* Cuvier, 1828

Family 70 SILLAGINIDAE

254. *Sillago chondropus* Bleeker, 1849
255. *Sillago intermedius* Wongratana, 1977
256. *Sillago lutea* McKay, 1985
257. *Sillago sihama* (Forsskal, 1775)
258. *Sillago vincenti* McKay, 1980

Family 71 LACTARIIDAE

259. *Lactarius lactarius* (Bloch & Schneider, 1801)

Family 72 POMATOMIDAE

260. *Pomatomus saltatrix* (Linnaeus, 1766)

Family 73 CORYPHAENIDAE

261. *Coryphaena hippurus* Linnaeus, 1758
262. *Coryphaena equiselis* Linnaeus, 1758

Family 74 RACHYCENTRIDAE

263. *Rachycentron canadum* (Linnaeus, 1766)

Family 75 ECHENEIDAE

264. *Echeneis naucrates* Linnaeus, 1758

Family 76 CARANGIDAE

265. *Alectis ciliaris* (Bloch, 1787)
266. *Alectis indicus* (Ruppell, 1830)
267. *Alepes djedaba* (Forsskal, 1775)
268. *Alepes kleinii* (Bloch, 1793)
269. *Alepes melanoptera* Swainson, 1839
270. *Alepes vari* (Cuvier, 1833)
271. *Atropus atropos* (Bloch & Schneider, 1801)
272. *Atule mate* (Cuvier, 1833)
273. *Carangoides armatus* (Ruppell, 1830)
274. *Carangoides chrysophrys* (Cuvier, 1833)
275. *Carangoides coeruleopinnatus* (Ruppell, 1830)
276. *Carangoides ferdau* (Forsskal, 1775)
277. *Carangoides fulvoguttatus* (Forsskal, 1775)
278. *Carangoides malabaricus* (Bloch & Schneider, 1801)
279. *Carangoides praeustus* ([Bennett], 1830) .
280. *Carangoides talamparoides* Bleeker, 1852
281. *Caranx heberi* (Bennett, 1830)
282. *Caranx ignobilis* (Forsskal, 1775)
283. *Caranx melampygus* Cuvier, 1833
284. *Caranx sexfasciatus* Quoy & Gaimard, 1825
285. *Decapterus macrosoma* Bleeker, 1851
286. *Decapterus russelli* (Ruppell, 1830)
287. *Megalaspis cordyla* (Linnaeus, 1758)
288. *Parastromateus niger* (Bloch, 1795)
289. *Scomberoides commersonnianus* Lacepede, 1801
290. *Scomberoides lysan* (Forsskal, 1775)
291. *Scomberoides tala* (Cuvier, 1832)
292. *Scomberoides tol* (Cuvier, 1832)
293. *Selar crumenophthalmus* (Bloch, 1793)
294. *Selaroides leptolepis* (Cuvier, 1833)
295. *Seriolina nigrofasciata* (Ruppell, 1829)
296. *Trachinotus baillonii* (Lacepede, 1801)
297. *Trachinotus blochii* (Lacepede, 1801)
298. *Trachinotus botla* (Shaw, 1803)
299. *Trachinotus mookalee* Cuvier, 1832
300. *Uraspis helvola* (Forster, 1801)

Family 77 MENIDAE

301. *Mene maculata* (Bloch & Schneider, 1801)

Family 78 LEIOGNATHIDAE

302. *Equulites leuciscus* (Günther, 1860)
303. *Eubleekeria splendens* (Cuvier, 1829)
304. *Gazza achlamys* Jordan & Starks, 1917
305. *Gazza minuta* (Bloch, 1795)
306. *Leiognathus berbis* (Valenciennes, 1835)
307. *Leiognathus daura* (Cuvier, 1829)
308. *Leiognathus dussumieri* (Valenciennes, 1835)
309. *Leiognathus equulus* (Forsskal, 1775)
310. *Leiognathus fasciatus* (Lacepède, 1803)

311. *Leiognathus lineolatus* (Valenciennes, 1835)
312. *Nuchequula blochii* (Valenciennes, 1835)
313. *Nuchequula gereoides* (Bleeker, 1851)
314. *Photopectoralis bindus* (Valenciennes, 1835)
315. *Secutor insidiator* (Bloch, 1787)
316. *Secutor ruconius* (Hamilton, 1822)

Family 79 LUTJANIDAE

317. *Aphareus furca* (Lacepede, 1801)
318. *Aphareus rutilans* Cuvier, 1830
319. *Aprion virescens* Valenciennes, 1830
320. ?*Aspilus fuscus* Valenciennes, 1830
321. *Etelis carbunculus* Cuvier, 1828
322. *Etelis coruscans* Valenciennes, 1862
323. *Lipocheilus carnolabrum* (Chan, 1970)
324. *Lutjanus argentimaculatus* (Forsskal, 1775)
325. *Lutjanus bengalensis* (Bloch, 1790)
326. *Lutjanus bohar* (Forsskal, 1775)
327. *Lutjanus ehrenbergii* (Peters, 1869)
328. *Lutjanus erythropterus* Bloch, 1790
329. *Lutjanus fulviflamma* (Forsskal, 1775)
330. *Lutjanus fulvus* (Forster, 1801)
331. *Lutjanus gibbus* (Forsskal, 1775)
332. *Lutjanus johni* (Bloch, 1792)
333. *Lutjanus kasmira* (Forsskal, 1775)
334. *Lutjanus lemniscatus* (Valenciennes, 1828)
335. *Lutjanus lunulatus* (Park, 1797)
336. *Lutjanus lutjanus* Bloch, 1790
337. *Lutjanus madras* (Valenciennes, 1831)
338. *Lutjanus malabaricus* (Bloch & Schneider, 1801)
339. *Lutjanus monostigma* (Cuvier, 1828)
340. *Lutjanus quinquelineatus* (Bloch, 1790)
341. *Lutjanus rivulatus* (Cuvier, 1828)
342. *Lutjanus russellii* (Bleeker, 1849)
343. *Lutjanus sanguineus* (Cuvier, 1828)
344. *Lutjanus sebae* (Cuvier, 1816)
345. *Lutjanus vitta* (Quoy & Gaimard, 1824)
346. *Macolor niger* (Forsskal, 1775)
347. *Paracaesio xanthura* (Bleeker, 1869)
348. *Pinjalo pinjalo* (Bleeker, 1850)
349. *Pristipomoides filamentosus* (Valenciennes, 1830)
350. *Pristipomoides multidens* (Day, 1871)
351. *Pristipomoides sieboldii* (Bleeker, 1854)
352. *Pristipomoides typus* Bleeker, 1852
353. *Pristipomoides zonatus* (Valenciennes, 1830)

Family 80 CAESIONIDAE

354. *Caesio caerulaurea* Lacepede, 1801
355. *Gymnocaesio gymnoptera* (Bleeker, 1856)
356. *Pterocaesio chrysozona* (Cuvier, 1830)
357. *Pterocaesio pisang* (Bleeker, 1953)
358. *Pterocaesio tile* (Cuvier, 1830)

Family 81 LOBOTIDAE

359. *Lobotes surinamensis* (Bloch, 1790)

Family 82 Gerreidae

360. *Gerres erythrourus* (Bloch, 1791)
361. *Gerres filamentosus* Cuvier, 1829
362. *Gerres limbatus* Cuvier, 1830
363. *Gerres oblongus* Cuvier, 1830
364. *Gerres oyena* (Forsskal, 1775)
365. *Gerres phaiya* Iwatsuki & Heemstra, 2001
366. *Gerres setifer* (Hamilton, 1822)
367. *Pentaprion longimanus* (Cantor, 1849)

Family 83 HAEMULIDAE

368. *Diagramma pictum* Thunberg, 1792)
369. *Plectorhinchus gibbosus* (Lacepede, 1802)
370. *Plectorhinchus griseus* (Cuvier, 1830)
371. *Plectorhinchus orientalis* (Bloch, 1793)
372. *Plectorhinchus pictus* (Tortonese, 1936)
373. *Plectorhinchus polytaenia* (Bleeker, 1852)
374. *Plectorhinchus schotaf* (Forsskal, 1775)
375. *Pomadasys argenteus* (Forsskål, 1775)
376. *Pomadasys argyreus* (Valenciennes, 1833)
377. *Pomadasys commersonnii* (Lacepède, 1801)
378. *Pomadasys furcatus* (Bloch & Schneider, 1801)

379. *Pomadasys kaakan* (Cuvier, 1830)
380. *Pomadasys maculatus* (Bloch, 1793)
381. *Pomadasys multimaculatum* (Playfair, 1867)
382. *Pomadasys olivaceum* (Day, 1875)

Family 84 NEMIPTERIDAE

383. *Nemipterus bipunctatus* (Valenciennes, 1830)
384. *Nemipterus japonicus* (Bloch, 1791)
385. *Nemipterus randalli* Russell, 1986
386. *Nemipterus zysron* (Bleeker, 1857)
387. *Parascolopsis aspinosa* (Rao & Rao, 1981)
388. *Parascolopsis townsendi* Boulenger, 1901
389. *Scolopsis vosmer*i (Bloch, 1792)

Family 85 LETHRINIDAE

390. *Gnathodentex aurolineatus* (Lacepede, 1802)
391. *Gymnocranius elongatus* Setna, 1973
392. *Gymnocranius grandoculis* (Valenciennes, 1830)
393. *Lethrinus lentjan* (Lacepede, 1802)
394. *Lethrinus nebulosus* (Forsskal, 1775)

Family 86 SPARIDAE

395. *Acanthopagrus berda* (Forsskal, 1775)
396. *Acanthopagrus bifasciatus* (Forsskål, 1775)
397. *Acanthopagrus latus* (Houttuyn, 1782)
398. *Argyrops spinifer* (Forsskal, 1775)
399. *Cheimerius nufar* (Valenciennes, 1830)
400. *Crenidens crenidens* (Forsskål, 1775)
401. *Rhabdosargus sarba* (Forsskål, 1775)
402. *Sparidentex hasta* (Valenciennes, 1830)

Family 87 POLYNEMIDAE

403. *Eleutheronema tetradactylum* (Shaw, 1804)
404. *Filimanus similis* Feltes, 1991
405. *Filimanus xanthonema* (Valenciennes, 1831)
406. *Leptomelanosoma indicum* (Shaw, 1804)
407. *Polydactylus plebeius* (Broussonet, 1782)
408. *Polydactylus sextarius* (Bloch & Schneider, 1801)
409. *Polynemus paradiseus* Linnaeus, 1758

Family 88 SCIAENIDAE

410. *Daysciaena albida (*Cuvier, 1830)
411. *Dendrophysa russelii* (Cuvier, 1829)
412. *Johnieops borneensis* (Bleeker, 1851)
413. *Johnieops dussumieri* (Cuvier, 1830)
414. *Johnieops macrorhynus* Mohan, 1976
415. *Johnieops osseus* (Day, 1876)
416. *Johnius belangerii* (Cuvier, 1830)
417. *Johnius carouna* Bloch, 1793
418. *Johnius carutta* Bloch, 1793
419. *Johnius dussumieri* (Valenciennes, 1833)
420. *Johnius elongatus* Mohan,1976
421. *Johnius glaucus* (Day, 1876)
422. *Johnius macropterus* (Bleeker, 1853)
423. *Kathala axillaries* (Cuvier, 1830)
424. *Nibea coibor* (Hamilton, 1822)
425. *Nibea maculata* (Bloch & Schneider, 1801)
426. *Nibea soldado* (Lacepede, 1802)
427. *Otolithes cuvieri* Trewavas, 1974
428. *Otolithes rubber* (Bloch & Schneider, 1801)
429. *Panna microdon* (Bleeker, 1849)
430. *Paranibea semiluctuosa* (Cuvier, 1830)
431. *Pennahia anea* (Bloch, 1793)
432. *Protonibea diacanthus* (Lacepede, 1802)

Family 89 MULLIDAE

433. *Mulloidichthys flavolineatus* (Lacepède, 1801)
434. *Mulloidichthys vanicolensis* (Valenciennes, 1831)
435. *Parupeneus barberinus* (Lacepède, 1801)
436. *Parupeneus cyclostomus* (Lacepède, 1801)
437. *Parupeneus heptacanthus* (Lacepede)
438. *Parupeneus indicus* (Shaw, 1803)
439. *Parupeneus macronemus* (Lacepède, 1801)
440. *Parupeneus trifasciatus* (Lacepede)
441. *Upeneus guttatus* Day, 1868
442. *Upeneus molluccensis* (Bleeker, 1855)
443. *Upeneus sulphureus* Cuvier, 1829

444. *Upeneus sundaicus* (Bleeker, 1855)
445. *Upeneus tragula* Richardson, 1846
446. *Upeneus vittatus* (Forsskal, 1775)

Family 90 MONODACTYLIDAE

447. *Monodactylus argenteus* (Linnaeus, 1758)
448. *Monodactylus falciformis* Lacepede, 1801

Family 91 TOXOTIDAE

449. *Toxotes chatereus* (Hamilton, 1822)
450. *Toxotes jaculatrix* (Pallas, 1767)

Family 92 KYPHOSIDAE

451. *Kyphosus cinerascens* (Forsskal, 1775)

Family 93 DREPANIDAE

452. *Drepane punctata* (Linnaeus, 1758)

Family 94 CHAETODONTIDAE

453. *Chaetodon collarae* Bloch, 1787)
454. *Heniocus acuminatus* (Linnaeus, 1758)

Family 95 POMACANTHIDAE

455. *Apolemichthys xanthurus* (Bennett, 1833)
456. *Pomacanthus annularis* (Bloch, 1787)

Family 96 TERAPONIDAE

457. *Pelates quadrilineatus* (Bloch, 1790)
458. *Terapon jarbua* (Forsskal, 1775)
459. *Terapon theraps* Cuvier, 1829
460. *Terapon puta* Cuvier, 1829

Family 97 KUHLIIDAE

461. *Kuhlia mugil* (Forster, 1801)
462. *Kuhlia rupestris* (Lacepede, 1802)

Family 98 CICHLIDAE

463. *Etroplus canarensis* Day, 1877
464. *Etroplus maculatus* (Bloch, 1795)
465. *Etroplus suratensis* (Bloch, 1790)
466. *Oreochromis mossambicus* (Peters, 1852)

Family 99 LABRIDAE

467. *Halichoeres marginatus* Ruppell, 1835

Family 100 SCARIDAE

468. *Scarus ghobban* Forsskal, 1775
469. *Scarus russelii* Valenciennes, 1840

Family 101 PINGUIPEDIDAE

470. *Parapercis hexophthalma* (Cuvier, 1829)

Family 102 CALLIONYMIDAE

471. *Callionymus japonicus* Houttuyn, 1782

Family 103 ELEOTRIDAE

472. *Butis butis* (Hamilton, 1822)
473. *Bunaka gyrinoides* (Bleeke, 1853r)
474. *Eleotris fusca* (Bloch & Schneider, 1801)
475. *Ophiocara porocephala* (Valenciennes, 1837)

Family 104 GOBIIDAE

476. *Glossogobius giuris* (Hamilton, 1822)
477. *Oxyurichthys microlepis* (Bleeker, 1849)
478. *Oxyurichthys tentacularis* (Valenciennes, 1837)
479. *Psammogobius biocellatus* (Valenciennes, 1837)
480. *Sicyopterus griseus* (Day, 1877)
481. *Stenogobius gymnopomus* (Bleeker, 1853)
482. *Trypauchen vagina* (Bloch & Schneider, 1801)
483. *Yongeichthys criniger* (Valenciennes, 1837)

Family 105 EPHIPPIDAE

484. *Ephippus orbis* (Bloch, 1787)
485. *Platax orbicularis* (Forsskal, 1775)
486. *Platax teira* (Forsskal, 1775)

Family 106 SCATOPHAGIDAE

487. *Scatophagus argus* (Linnaeus, 1766)

Family 107 SIGANIDAE

488. *Siganus canaliculatus* (Park, 1797)
489. *Siganus javus* (Linnaeus, 1766)
490. *Siganus vermiculatus* (Valenciennes, 1835)

Family 108 ACANTHURIDAE

491. *Acanthurus mata* (Cuvier, 1829)

Family 109 SPHYRAENIDAE

492. *Sphyraena acutipinnis* Day, 1876
493. *Sphyraena barracuda* (Edwards, 1771)
494. *Sphyraena forsteri* Cuvier, 1829
495. *Sphyraena jello* Cuvier, 1829
496. *Sphyraena obtusata* Cuvier, 1829

Family 110 GEMPYLIDAE

497. *Gempylus serpens* Cuvier, 1829

498. *Nealotus tripes* Johnson, 1865
499. *Neopinnula orientalis* (Gillchrist & von Bonde, 1924)
500. *Promethichthys prometheus* (Cuvier, 1832)
501. *Rexea bengalensis* (Alcock, 1894)
502. *?Rexea prometheoides* (Bleeker, 1856)

Family 111 TRICHIURIDAE

503. *Eupleurogrammus glossodon* (Bleeker, 1860)
504. *Eupleurogrammus muticus* (Gray, 1831)
505. *Lepturacanthus savala* (Cuvier, 1829
506. *Trichiurus auriga* Klunzinger, 1884
507. *Trichiurus lepturus* Linnaeus, 1758

Family 112 SCOMBRIDAE

508. *Acanthocybium solandri* (Cuvier, 1832)
509. *Auxis rochei* (Risso, 1810)
510. *Auxis thazard* (Lacepede, 1800)
511. *Euthynnus affinis* (Cantor, 1849)
512. *Gymnosarda unicolor* (Rüppell, 1836)
513. *Katswonus pelamis* (Linnaeus, 1758)
514. *Rastrelliger kanagurta* (Cuvier, 1816)
515. *Sarda orientalis* (Temminck & Schlegel, 1844)
516. *Scomberomorus commerson* (Lacepede, 1800)
517. *Scomberomorus guttatus* (Bloch & Schneider, 1801)
518. *Scomberomorus koreanus* (Kishinouye, 1915)
519. *Scomberomorus lineatus* (Cuvier, 1829)
520. ?*Thunnus albacore* (Bonnaterre, 1788)
521. *Thunnus tonggol* (Bleeker, 1851)

Family 113 XIPHIIDAE

522. *Xiphias gladius* Linnaeus, 1758

Family 114 ISTIOPHORIDAE

523. *Istiophorus platypterus* (Shaw, 1792)
524. *Makaria indica* (Cuvier, 1832)
525. ?*Tetrapterus angustirostris* Tanaka, 1915
526. *Tetrapterus audax* (Philippi, 1887)

Family 115 CENTROLOPHIDAE

527. *Psenopsis cyanea* (Alcock, 1890)

Family 116 ARIOMMATIDAE

528. *Ariomma indicum* (Day, 1871)

Family 117 STROMATEIDAE

529. *Pampus argenteus* (Euphrasen, 1788)
530. *Pampus chinensis* (Euphrasen, 1788)

Order XXIX PLEURONECTIFORMES

Family 118 PSETTODIDAE

531. *Psettodes erumei* (Bloch & Schneider, 1801)

Family 119 BOTHIDAE

532. *Bothus pantherinus* (Ruppell, 1830)
533. *Bothus myriaster* (Temminck & Schlegel, 1846)
534. *Chascanopsetta lugubris* Alcock, 1894
535. *Engyprosopon grandisquama* (Temm. & Schlegel, 1846)

Family 120 PARALICHTHYIDAE

536. *Pseudorhombus triocellatus* (Bloch & Schneider, 1801)
537. *Pseudorhombus arsius* (Hamilton, 1822)
538. *Pseudorhombus elevatus* Ogilby, 1912
539. *Pseudorhombus javanicus* (Bleeker, 1853)
540. *Pseudorhombus malayanus* Bleeker, 1865

Family 121 SOLEIDAE

541. *Aesopia cornuta* Kaup, 1858
542. *Brachirus orientalis* (Bloch & Schneider, 1801)
543. *Solea elongata* Day, 1877
544. *Synaptura albomaculata* Kaup, 1858
545. *Synaptura commersonnii* (Lacepede, 1802)
546. *Zebrias quagga* (Kaup, 1858)
547. *Zebrias synapturoides* (Jenkins, 1910)

Family 122 CYNOGLOSSIDAE

548. *Cynoglossus arel* (Bloch & Schneider, 1801)
549. *Cynoglossus bilineatus* (Lacepede, 1802)
550. *Cynoglossus carpenteri* Alcock, 1889
551. *Cynoglossus dispar* Day, 1877
552. *Cynoglossus dubius* Day, 1873

553. *Cynoglossus lida* (Bleeker, 1851)
554. *Cynoglossus lingua* Hamilton, 1822
555. *Cynoglossus macrostomus* Norman, 1926
556. *Cynoglossus punticeps* (Richardson, 1846)
557. *Paraplagusia bilineata* (Bloch, 1787)

Order XXX TETRAODONTIFORMES

Family 123 TRIACANTHIDAE

558. *Pseudotriacanthus strigilifer* (Cantor, 1849)
559. *Triacanthus biaculeatus* (Bloch, 1786)

Family 124 BALISTIDAE

560. *Abalistes stellatus* (Lacepede, 1798)

Family 125 MONACANTHIDAE

561. *Aluterus monoceros* (Linnaeus, 1758)

Family 126 OSTRACIIDAE

562. *Lactoria cornuta* (Linnaeus, 1758)
563. *Ostracion meleagris* Shaw, 1796
564. *Tetrosomus gibbosus* (Linnaeus, 1758)

Family 127 TETRAODONTIDAE

565. *Lagocephalus inermis* (Schlegel, 1850)
566. *Lagocephalus lunaris* (Bloch & Schneider, 1801)
567. *Lagocephalus spadiceus* (Richardson, 1845)

Family 128 DIODONTIDAE

568. *Chilomycterus orbicularis* (Bloch, 1785)
569. *Diodon hystrix* Linnaeus, 1758
570. *Diodon holocanthus* Linnaeus, 1758

SYSTEMATIC ACCOUNT

The marine and estuarine fish fauna of Karnataka are broadly divided into two classes: Chondrichthyes and Osteichthyes as follows:

Key to the classes

1a. Body made up of cartilaginous skeleton; five to seven pairs of lateral or ventral, nonconfluent gill slits without gill covers ... CHONDRICHTHYES

1b. Body made up of bony skeleton; one pair of lateral gill slits confluent as a single ventral slit or nonconfluent as lateral gill slits with gill cover ..... OSTEICHTHYES

Class CHONDRICHTHYES
(Cartilaginous fishes)

Skeleton is mainly made of soft cartilage, but partly hardened by calcification. Skin superficially naked with small denticles (or embedded placoid scales). There is no suture in the skull and endocraniun never ossified, but superficially calcified. There are usually 5 pairs of gill openings lateral on sides of head in sharks or on ventral side of disc in Batoid fishes. Gill cover or operculum absent. Teeth not fused to jaws and replaced serially. Single nasal opening that usually separated by a flap into incurrent and excurrent openings and mostly placed on ventral side of head. Intestinal spiral valve present. Fin rays soft, unsegmented. Tail usually heterocercal. Air bladder absent. Males posess paired copulatory organs called claspers.

Key to the orders

1a. Gill slits present on lateral sides of head; anal fin present 2

1b. Gill slits on ventral sides of head; anal fin absent (Batoid fishes –Skates and Rays) 4

2a. Mouth anterior to orbit .... ORECTOLOBIFORMES

2b. Mouth posterior to front margin of orbit 3

3a. Eyes with nictitating eyelids; intestine with spiral or scroll valve .... CARCHARHINIFORMES

3b. Eyes without nictitating eyelids; intestine without spiral or scroll valve .... LAMNIFORMES

4a. Body shark-like in appearance, somewhat depressed; pectoral fins barely enlarged; tail not distinctly marked off from the body ... 5

4b. Body not shark-like, but distinctly depressed;

pectoral fins broadly enlarged; tail almost marked off from the body.....6

5a. Snout conspicuously elongate, prolonged into a long, flat plate having a row of large teeth-like structure (saw-like) on each side .... PRISTIFORMES

5b. Snout wedge-shaped and prolonged, not blade-like and without lateral teeth .... RAJIFORMES

6a. Caudal fin well-developed; electric organs in head region present; skin soft and flabby... .....TORPEDINIFORMES

6b. Caudal fin and electric organs absent; skin firm ..... MYLIOBATIFORMES

Order I ORECTOLOBIFORMES

Head conical to greatly depressed with short snout. Mouth small or large, subterminal to ventral; its cleft ends before the eyes. Eyes placed dorsolateral on head or lateral in some and with out nictitating membrane. Nostrils longitudinal on snout, connected with mouth. Nasoral grooves prominent. Barbels usually present. Two spineless dorsal fins. Anal fin present. Spiracles present, close behind and about level with the eyes. Five pairs of gill slits on sides of head, last two to four above or behind pectoral fin origins.

Key to the families

1a. Caudal fin almost equal to rest of body ....STEGOSTOMATIDAE

1b. Caudal fin considerably shorter than rest of body 2

2a. Mouth extremely large and terminal; external gill slits very large, internal gill slits inside mouth cavity with filter screens; caudal peduncle with strong lateral keels and an upper precaudal pit; caudal fin with a strong ventral lobe and subterminal notch ....RHINCODONTIDAE

2b. Mouth smaller and subterminal; externl gill slits small, internal gill slits without filter screens; caudal peduncle without strong lateral keels and precaudal pits; caudal fin with a weak ventral lobe or none, but with a strong terminal lobe and subterminal notch 3

3a. Nostrils with a lobe and groove around outer borders; spiracles large, below eyes; precaudal tail much greater than head length and body depth ..... HEMISCYLLIDAE

3b. Nostrils without a lobe and groove around outer borders; spiracles small, behind but not below eyes; precaudal tail short, much shorter than head length and body depth .... GLYMOSTOMATIDAE

Family 1 HEMISCYLIDAE
(Bamboo sharks, Longtailed carpet sharks)

Body cylindrical or slightly depressed, with or without ridges on sides. Mouth small and transverse, anterior to eyes. Eyes dorsolateral with large spiracles below them. Gill slits small and fifth overlapping fourth. Two dorsal fins without spines, the second dorsal fin insertion well ahead of anal fin origin. Anal fin rounded with keel-like apex, separated from the lower caudal origin by a narrow notch. Precaudal tail long, much greater than head length and body depth. Caudal peduncle without lateral keels and precaudal pits.

Species known to occur in Karnataka

1. *Chiloscyllium arabicum* Gubanov (Arabian bamboo shark)
2. *Chiloscyllium griseum* Muller & Henle (Grey bamboo shark)
3. *Chiloscyllium indicum* (Gmelin) (Slender bamboo shark)

Key to the species

1a. Lateral ridges present on sides of body; body and tail very slender; anal fin length from origin to free rear tip almost equal to length of hypural caudal lobe; body covered with numerous small dark spots, bars, and saddles on a light background .....*C. indicum*

1b. Lateral ridges absent on sides of body; body

and tail relatively stout; anal fin length distinctly shorter than hypural caudal lobe; adults uniform in colour, juveniles with or without broad bars on sides 2

2a. Predorsal and interdorsal ridges prominent; base of second dorsal fin usually longer than first dorsal fin base; juveniles uniform in colour except spotted fins ..... *C. arabicum*

2b. Predorsal and interdorsal ridges not prominent; base of second dorsal fin usually shorter than first dorsal fin base; juveniles usually with saddles and bars on body .... *C. griseum*

Fisheries infirmation : These fishes are regularly taken in inshore waters and utilized for human consumption.

Remarks : Distinct concave rear margins of dorsal fins separate *C. punctatum* from *C. arabicum* and the later species occur all along west coast of India.

Family 2 STEGOSTOMATIDAE
(**Zebra shark**)

Body cylindrical with conspicuous ridges on sides. Mouth small and transverse, anterior to eyes. Eyes lateral and spiracles subequal in size to eyes but not below them. Gill slits small, fifth overlapping fourth. Caudal peduncle without lateral keels and precaudal pits. First dorsal fin larger than second, its origin extended well anterior to origin of pelvic fins and insertion almost over pelvic fins. Immature specimens with dark saddles, but the adult specimens with dark spots.

Species known to occur in Karnataka

1. *Stegostoma fasciatum* (Hermann) (Zebra shark)

Fisheries information : Zebra shark is a common species occurring in both the coasts of our country. The flesh is used fresh and dried salted for human consumption. Its livers are processed for vitamins; fins dried and processed for the oriental shark fin trade and offal used for fishmeal.

Family 3 GYNGLIMOSTOMATIDAE
(**Nurse Sharks**)

Head without lateral flaps of skin. Body cylindrical, somewhat depressed, without ridges on sides. Eyes dorsolateral or lateral. Spiracles much smaller than eyes, posterior to eyes but not below them. Gill openings small, fifth practically overlapping fourth. Nostrils with short or moderately long, pointed barbels, but without circumnarial folds or grooves. Mouth small, transverse, anterior to eyes. Caudal peduncle without lateral keels and precaudal pits. Dorsal fins two, without spines; the second dorsal fin insertion well anterior to anal fin insertion. Precaudal tail short, much shorter than head length and body depth. Juvenile specimens plain or with dark spots.

Species known to occur in Karnataka

1. *Nebrius ferrugineus* (Lesson) (Tawny nurse shark)

Fisheries information : Tawny nurse shark is a common species occurring in both the coasts of our country. Its flesh is used fresh and dried salted for human consumption. Its livers are utilized for oils and vitamins, fins are utilized in the oriental shark fin trade and offal is used for fishmeal. Its thick, armor-like skin is potentially valuable for leather.

Family 4 RHINCODONTIDAE
(**Whale sharks**)

Head broad and flattened, without lateral flaps of skin. Body cylindrical or more or less depressed, with prominent ridges on sides. Eyes lateral, without subocular pockets. Spiracles smaller than eyes, posterior to them but not below them. Gill openings very large, fifth considerably separated from fourth. Nostrils with very small barbels and without circumnarial folds and grooves. Mouth practically terminal, anterior to eyes. Caudal peduncle with strong lateral keels and an upper precaudal pit. First dorsal fin much larger than second, its origin well anterior to insertion of pelvic fins and opposite to its bases. Body colour

light with vertical and horizontal stripes, in the form of a checkerboard.

Species known to occur in Karnataka

1. *Rhincodon typus* Smith (Whale shark)

Fisheries information : Whale shark is a common species occurring in both the coasts of our country. Its flesh is consumed.

Order II LAMNIFORMES

Body large with a conical to slightly depressed snout. Mouth large, extending well posterior to the eyes. Teeth enlarged anteriorly. Nostrils free from mouth; nasoral and circumnarial grooves absent. Eyes lateral, without nictitating membrane. Barbels absent. Five gill slits, last two either anterior to or above origin of pectoral fins. Spiracles small, present posterior to eyes. Two dorsal fins without spines. Anal fin present. Intestinal valve of ring type.

Key to the families

1a. Caudal fin length almost same as long as rest of body ..... ALOPIIDAE

1b. Caudal fin length much shorter than rest of body 2

2a. Caudal fin somewhat symmetrical and lunate, preventral caudal border more or less equal to dorsal border of caudal fin; caudal peduncle with very strong lateral keels..... ..... LAMNIDAE

2b. Caudal fin asymmetrical, not lunate, preventral caudal border much shorter than dorsal border of caudal fin; caudal peduncle without lateral keels or with weak ones ....ODONTASPIDIDAE

Family 5 ALOPIDAE
(Thresher sharks)

A family of large sharks where upper lobe of caudal fin greatly elongate, cadual fin almost half of the total length. Third and fifth gill openings over origin of pectoral fins. Snout moderately long, bluntly conical. Mouth small but arched and elongated, extending well beyond eyes. Eyes without nictitating lower eyelids. Two dorsal fins, the second one minute. Pectoral fins narrow, long and falcate, broad-tipped. Precaudal pit present.

Species known to occur in Karnataka

1. *Alopias pelagicus* Nakamura (Pelagic thresher)
2. *Alopias vulpinus* (Bonnaterre) (Thresher shark)

Key to the species

1a. Pectoral fins nearly straight and broad-tipped; labial furrows absent; sides above pectoral fin bases dark, without an extension of the white of abdominal area..... *A. pelagicus*

1b. Pectoral fins falcate and narrow-tipped; labial furrows present; sides above pectoral-fin bases marked with a white patch extending forward from abdominal area ... *A. vulpinus*

Fisheries information : Its fisheries importance is minor, eaten locally fresh and salted and dried.

Remarks : This species uses its long tail to herd small fishes into a ball and then attcks the fish

Family 6 ODONTASPIDAE
(Sand tiger shark)

Mouth large, extending beyond eyes. Snout conical to slightly depressed and pointed. Gill slits not extending onto dorsal surface of head, anterior to pectoral fin bases. Two dorsal fins and an anal fin. Pectoral fins small. Caudal peduncle compressed without keels but with an upper precaudal pit and an asymmetrical caudal fin with a strong and short ventral lobe.

Species known to occur in Karnataka

1. *Carcharias taurus* Rafinesque

Fisheries information : Indian sand tiger shark is a common species found in both the coasts of our country. This species is apparently captured in India and Pakistan. It is a poorly known species.

Remarks : *Carcharias tricuspidatus* Day usually known to occur along this coast is considered under synonymy of *Carcharias taurus* Rafinesque (Compagno, 2001).

Family 7 LAMNIDAE
(Mackerel shark)

Body spindle shaped with pointed snouts. Mouth large, extending beyond eyes. Gill slits extending onto dorsal surface of head, anterior to pectoral fin bases. First dorsal fin large and second dorsal fin and anal fins minute and pivoting. Pectoral fins moderately long and broad, shorter than head length. Caudal fin lunate. Precaudal pits present, caudal peduncle strongly depressed and with strong keels. Ventral side of body white.

Species known to occur in Karnataka

1. *Isurus oxyrinchus* Rafinesque (Shortfin mako)

Fisheries information : Shortfin mako is a common species occurring in both the coasts of our country. Its flesh is consumed fresh, frozen, smoked and dried salted; its liver is used for oils and vitamins; fins utilized for shark-fin soup; skins processed into leather and the jaws and teeth are used for ornaments.

Order III CARCHARHINIFORMES

Body cylindrical to spindle-shaped. Head conical to depressed (anteriorly expanded in Hammerhead sharks). Mouth, extending posterior to the eyes. Eyes lateral in position, with nictitating eyelids or membrane. Two spineless dorsal fins. Anal fin present. Gill openings lateral; five gill slits, with the last one to three above the pectoral fins. No gill rakers. Spiracles usually absent (small ones in Hemigaleidae). Intestinal valve spiral or scroll type.

Key to the families

1a. Head with lateral, blade-like expansions ..... SPHYRNIDAE

1b. Head normal, without lateral expansions 2

2a. First dorsal fin base opposite or behind pelvic fin bases ..... SCYLIORHINIDAE

2b. First dorsal fin base anterior to pelvic fin bases 3

3a. Precaudal pits absent. Dorsal caudal border not undulated ..... TRIAKIDAE

3b. Precaudal pits present. Dorsal caudal border undulated 5

4a. Intestinal valve of scroll type .... CARCHARHINIDAE

4b. Intestinal valve of spiral type .... HEMIGALEIDAE

Family 8 SCYLIORHINIDAE
(Catsharks)

Body generally elongated and head without lateral expansions. Eyes cat-like with nictitating eyelids. Mouth large, maxilla extending to front border of eyes. Two dorsal fins and an anal fin, the first dorsal fin base over or behind pelvic fin bases. Precaudal pits absent. Caudal fin without a strong ventral lobe or lateral undulations on its dorsal border. Body colour generally variegated.

Species known to occur in Karnataka

1. *Atelomycterus marmoratus* (Bennett) (Coral catshark)
2. *Halaelurus quagga* (Alcock) (Qugga catshark)

Key to the species

1a. Supraorbital crests present; body highly variegated, dorsal saddles obsolete, black spots enlarged and usually merging together to form dash and bar marks .... *A. marmoratus*

1b. Supraorbital crests absent; body light brown dorsally with over 20 dark brown narrow vertical bars ..... *H. quagga*

Fisheries information : *A. marmoratus* is captured occasionally and flesh used as food. *H. quagga* is rare in occurrence.

Remarks : Reports of these two species need further verification.

Family 9 TRIAKIDAE
(Hound sharks)

Head without lateral expansions. Mouth large, extending to front border of eyes. Eyes with nictitating eyelids. Two moderate sized spineless dorsal fins and an anal fin, the first dorsal fin well ahead to pelvic fin bases. Caudal fin without a strong ventral lobe or lateral undulations on its dorsal surface. Intestine with a spiral valve of 4 to 11 turns.

Species known to occur in Karnataka

1. *Iago omanensis* (Norman) (Bigeye houndshark)
2. *Mustelus mosis* Hemprich & Ehrenberg (Arabian Smooth hound)

Key to the species

1a. Eyes lateral, subocular ridges obsolete; origin of first dorsal fin far anterior, over pectoral fin bases ..... *I. omanensis*

1b. Eyes dorsolateral, subocular ridges strong; origin of first dorsal fin more posterior, over or behind pectoral fin bases..... *M. mosis*

Fisheries information : These fishes are of limited fisheries interest, but regularly captured, mostly by gillnet, and utilized as human food.

Family 10 HEMIGALEIDAE
(Weasel sharks)

Head without lateral expansions. Mouth large, extending to anterior border of eyes. Eyes with nictitating eyelids. Two moderate sized spineless dorsal fins and an anal fin, the first dorsal fin base considerably anterior to pelvic fin bases. Precaudal pits present. Caudal fin with a strong ventral lobe and lateral undulations on its dorsal border. Intestine with a spiral valve.

Species known to occur in Karnataka

1. *Chaenogaleus macrostoma* (Bleeker) (Hooktooth shark)
2. *Hemipristis elongata* (Klunzinger) (Snaggletooth shark)

Key to the species

1a. Snout obtusely wedge-shaped in dorsolateral view; lower jaw rounded at symphysis; no toothless space at middle of jaws; mesial edges of teeth unserrated, sometimes a few cusplets on mesial edges of lower teeth; fins not falcate, posterior margin of anal and second dorsal moderately concave, those of pectorals and pelvics straight or slightly concave ..... *C. macrostoma*

1b. Snout bluntly rounded in dorsolateral view; lower jaw truncated at sysmphysis; a toothless space at middle of both jaws; mesial edges of upper teeth and most of lower teeth serrated or with a few cusplets (smooth in young below 55 cm); fins strongly falcate, posterior margin of anal, second dorsal, pectoral and pelvic fins deeply concave .... *H. elongata*

Fisheries information : These sharks are very common in both the coasts of our country. The flesh of both the shark is utilized for human consumption. The livers of Snaggletooth shark are processed for vitamins, fins used in the oriental shark fin trade and offal for fishmeal.

Family 11 CARCHARHINIDAE
(Requiem sharks)

Head without lateral expansions. Mouth extends to front margin of eyes. Eyes with internal nictitating eyelids. Two dorsal fins and an anal fin, the first dorsal fin with its base well anterior to pelvic fin bases. Precaudal pits present. Caudal fin with a strong ventral lobe and lateral undulations on its dorsal border. Intestine with a scroll valve. Body colour variable, usually no colour pattern.

Species known to occur in Karnataka

1. *Carcharhinus amblyrhynchoides* (Whitley) (Graceful shark)

2. *Carcharhinus dussumieri* (Muller & Henle) (White-cheek shark)
3. *Carcharhinus hemiodon* (Valenciennes) (Pondicherry shark)
4. *Carcharhinus limbatus* (Valenciennes) (Black-tip shark)
5. *Carcharhinus longimanus* (Poey) (Oceanic white-tip shark)
6. *Carcharhinus leucas* (Valenciennes) (Bull shark)
7. *Carcharhinus macloti* (Muller & Henle) (Hard-nose shark)
8. *Carcharhinus melanopterus* (Quoy & Gaimard) (Black-tip reef shark)
9. *Carcharhinus sorrah* (Muller & Henle) (Spot-tail shark)
10. *Galeocerdo cuvieri* (LeSueur) (Tiger shark)
11. *Lamiopsis temminckii* (Muller & Henle) (Broad-fin shark)
12. *Loxodon macrorhinus* Muller & Henle (Slit-eye shark)
13. *Negaprion acutidens* (Ruppell) (Sickle-fin Lemon shark)
14. *Prionace glauca* (Linnaeus) (Blue shark)
15. *Rhizoprionodon acutus* (Ruppell) (Milk shark)
16. *Rhizoprionodon oligolinx* Springer (Grey sharpnose shark)
17. *Scoliodon laticaudus* (Muller & Henle) (Spade-nose shark)

Key to the species

1a. Upper precaudal pit longitudinal; height of second dorsal fin more than 75% of first dorsal fin height 2

1b. Upper precaudal pit crescentic or transverse; height of second dorsal fin less than 50% of first dorsal fin height 3

2a. Preoral snout length about equal to mouth width; teeth in jaws of different shape, uppers with broadly triangular, serrated cusps, lowers with narrow, smooth cusps ... *L. temminckii*

2b. Preoral snout length much less than mouth width; teeth in jaws similar in shape, both with narrow, smooth-edged cusps ..... *N. acutidens*

3a. Upper labial furrows extending to front of eyes; spiracles present; teeth in characteristic cockscomb shape; a prominent dermal keel on caudal peduncle; vertical black or dusky bars on back, obscure or absent in adults .. *G. cuvieri*

3b. Upper labial furrows not extending to front of eyes; spiracles absent; teeth not cockscomb-shaped; dermal keel on caudal peduncle absent or a low one; no vertical bars on back 4

4a. Second dorsal origin well behind anal origin, usually over or slightly anterior to anal insertion, clearly behind midbase of anal fin 5

4b. Second dorsal fin origin usually slightly in front, above or behind anal fin origin, in front of midbase of anal fin 8

5a. Pectoral fins broadly triangular and very long; their length from origins to free rear tips about equal to their anterior margins; free rear tip of first dorsal extending beyond origin of pelvic fins to about over their midbases ..... *S. laticaudus*

5b. Pectoral fins narrower; their length from origins to free rear tips 4/5 or less of anterior margins; free rear tip of first dorsal reaching at most to pelvic fin origins 6

6a. First dorsal fin base 2 to 3 times in distance between pectoral and pelvic bases; distinct notch on posterior edge of eyes present ..... *L. macrorhinus*

6b. First dorsal fin base usually less than 2 times in distance between pectoral and pelvic bases; distinct notch on posterior edge of eyes absent 7

7a. Upper labial furrows well developed, about equal to eye length ..... *R. acutus*

7b. Upper labial furrows very short, much less than eye length ..... *R. oligolinx*

8a. Midbase of first dorsal fin much closer to pelvic fin bases than pectorals; caudal peduncle with weak lateral keels; colour brilliant dark blue above in life ... *P. glauca*

8b. Midbase of first dorsal fin equidistant between pectoral and pelvic fin bases or closer to pectoral fin bases; caudal peduncle without lateral keel; colour varied but not brilliant dark blue above in life 9

9a. Second dorsal fin with a distinct black-tip, all other fins without markings .... *C. dussumieri*

9b. Second dorsal fin plain dusky, white or black-tipped, but if black-tipped, other fins also with distinct black markings 10

10a. A prominent or low ridge between first and second dorsal fins present 11

10b. Ridge between first and second dorsal fins absent 13

11a. First dorsal and pectoral fins very large with broad rounded tips distally .... *C. longimanus*

11b. First dorsal and pectoral fins smaller, with distally pointed or narrowly rounded tips 12

12a. Inner margin of second dorsal fin about 1.5 times in fin height; upper anterolateral teeth with smooth or weakly serrated cusps; 14 or 15 rows of upper anteroposterior teeth .... *C. hemiodon*

12b. Inner margin of second dorsal fin above 2 times in fin height; upper anterolateral teeth with strongly serrated cusps; 12 rows of upper anteroposterior teeth ..... *C. sorrah*

13a. First dorsal fin origin anterior or closer to pectoral fin insertions than to its free rear tips; second dorsal fin origin over or anterior to (mostly in front of) anal fin origin 14

13b. First dorsal fin origin over or closer to pectoral fin free rear tips than to its insertions; second dorsal fin origin over or behind anal fin origin 16

14a. Snout very short and broadly rounded, internarial space less than preoral length ... . *C. leucas*

14b. Snout moderately short to long and pointed, internarial space more than preoral length. 15

15a. Snout short and wedge-shaped, internarial space 1.0 to 1.2 times in preoral snout; inner margin of second dorsal fin long, its length 1.0 to 1.2 times in its height .... *C. amblyrhinchoides*

15b. Snout longer and pointed, internarial space 1.3 to 1.7 times in preoral snout; inner margin length of second dorsal fin 1.1 to 1.6 times in its height ..... *C. limbatus*

16b. Internarial length 0.9 to 1.4 times in preoral snout length; entire posterior margin of caudal fin not with a black edge; second dorsal fin origin over or slightly anterior to anal fin origin First dorsal fin tip with a broad black blotch ..... *C. melanopterus*

16a. Internarial length 1.5 to 1.9 times in preoral snout length; entire posterior margin of caudal fin with a narrow black edge; second dorsal fin origin behind anal fin origin, about over its midbase; first dorsal fin tip plain, not black ..... *C. macloti*

Fisheries information : All species of Requiem shark are of commercial importance. Their flesh used for human food, livers processed for oil, fins used in the oriental shark-fin trade and offal for fishmeal.

Remarks : *R. oligolinx* has been reported from Karnataka coast as *Scoliodon palasorrah* (Cuvier) and *S. laticaudus*, as *Scoliodon sorrakowah* (Cuvier). Reports of *C. longimanus* and *P. glauca* along Karnataka coast need further confirmation.

Family 12 SPHYRNIDAE
(Hammerhead sharks)

Head with laterally expanded blades, like a double-bitted axe. Eyes with internal nictitating eyelids. Spiracles absent. First dorsal fin anterior to pelvic fin bases, varying from equidistant between pectoral and pelvic fin bases to closer to pectoral fin bases; midpoint of first dorsal fin base always anterior to pelvic fin origins. Second dorsal fin much smaller than first. Precaudal pits present. Ventral caudal lobe strong, undulations or ripples present in dorsal caudal border. Intestine with a scroll valve. Colour light grey or brownish above, white below or no colour pattern.

Species known to occur in Karnataka

1. *Eusphyra blochii* (Cuvier) (Winghead shark)
2. *Sphyrna lewini* (Griffith & Smith) (Scalloped hammerhead shark)
3. *Sphyrna mokarran* (Ruppell) (Great hammerhead shark)
4. *Sphyrna zygaena* (Linnaeus) (Smooth hammerhead shark)

Key to the species

1a. Lateral blades of head very narrow and wing-like; nostrils greatly enlarged their widths 0.8 to 0.9 times in the internarial width and almost twice the mouth width; knobs present along anterior border of head, opposite nostrils .... *E. blochii*

1b. Lateral blades of head anteroposteriorly broad, not wing-like; nostrils short, their widths 7 to 14 times in internarial width and less than half of mouth width; no knobs along anterior border of head 2

2a. Anterior border of head almost straight in adults; prenarial grooves absent or undeveloped; teeth strongly serrated at all sizes; pelvic fins high and falcate; first dorsal fin markedly falcate; second dorsal fin high, with a short inner margin and deeply concave posterior border ..... *S. mokarran*

2b. Anterior border of head moderately convex in adults, strongly so in young; prenarial grooves well-developed; teeth smooth-edged in young, weakly serrate in adults; pelvic fins low and not falcate, with almost straight posterior margins; first dorsal fin usually semifalcate; second dorsal fin low, with a long inner border and almost straight posterior border 3

3a. A distinct median indentation on anterior border of head; free rear tip of second dorsal fin almost reaching upper caudal origin; anal fin base larger than that of second dorsal fin ..... *S. lewini*

3b. No median indentation on anterior border of head; free rear tip of second dorsal fin considerably anterior to upper caudal origin; anal fin base equal to second dorsal fin base ..... *S. zygaena*

Fisheries information : *S. zygaena* is found in the south-east and south-west coasts and the rest three species are in both the coasts of our country. The flesh of the hammerhead sharks is utilized for human consumption, hides are processed for leather, fins are used in the shark-fin soup base and livers are processed for vitamins and carcasses for fishmeal.

Remarks : Report of *Sphyrna tudes* (Valenciennes) from Karnataka is referable to *Sphyrna lewini* (Griffith & Smith) (Talwar and Kacker, 1984).

Order IV SQUALIFORMES

These are small to moderate sized sharks. Body cylindrical to slightly compressed. Head with 5 gill slits, present before pectoral fin. Moderately large spiracles always present. Eyes without nictitating membrane. Dorsal fins two, with or without spines. Anal fin absent.

Family 13 SQUALIDAE
(Dogfish shark)

Both dorsal fins with spines, not grooved. Teeth on lower jaw not much larger than those on upper

jaw. Upper precaudal pit usually present; subterminal notch on caudal fin absent. Caudal peduncle with a pair of lateral keels.

Species known to occur in Karnataka

1. *Squalus mitsukurii* Jordan & Snyder (Shortspine spurdog)

Fisheries information : It is rare in occurrence, but of considerable economic importance and used for human consumption.

Remarks : There is no definite record of this species from Karnataka coast, but it is included here for Compagno (1984) recognise its occurrence along west coast of India.

Order V PRISTIFORMES

Body shark-like, head depressed. Snout produced into a long flat blade with teeth of equal size on each side of blade, embedded in deep sockets. Barbels absent. Two distinct spineless dorsal fins and well developed caudal fin. Gill openings on ventral side.

Family 14 PRISTIDAE
(Sawfishes)

Body shark-like and snout markedly produced into a narrow, flat blade-like projection, armed with teeth-like structures (saw-like). Gill openings on ventral side. Eyes and spiracles on top of head. Two dorsal fins widely separated. Pectoral fins small. Caudal fin well developed. Tail not marked off from the trunk. Body, fins and rostrum covered with small, closely set dermal denticles in adults, but juveniles of *Anoxypristis* are completely naked.

Species known to occur in Karnataka

1. *Anoxypristis cuspidata* (Latham)

Fisheries information : Flesh of this species is much esteemed as food and its liver yields considerable quantity of oil. This is critically endangered as per IUCN Red Data list and its capture is banned under WPA (1972) in India.

Order VI TORPEDINIFORMES

Body disc shaped. Skin soft and loose. Eyes small to obsolete. Powerful electric organs, derived from branchial muscles in head region, present. Electric organs largely used for feeding by stunning the prey and for defence to keep predators at bay. Caudal fins well developed.

Family 15 NARCINIDAE
(Electric rays)

Body soft and flabby with electric organs derived from branchial muscles present in the head region. Disc roundish to oval anteriorly. Deep or shallow groove present around mouth and lips. Jaws protractile. One or two spineless dorsal fins present on tail region. Dorsal fins, pelvic fins and caudal fin well developed. Anal fin absent.

Species known to occur in Karnataka

1. *Narke dipterygia* (Bloch & Schneider)

Fisheries information : It is not considered as a food fish, but often caught in bottom trawls.

Order VII RAJIFORMES

Body intermediate between shark-like and skate-like. Snout produced. Tail stout, not clearly marked off from body, gently tapering towards caudal fin. Caudal fin not bilobed. Two dorsal fins; first dorsal fin origin behind pelvic fins. A row of denticles on midline of back. Tail without spine.

Family 16 RHINOBATIDAE
(Guitar fishes)

Body more or less intermediate between shark-like and skate-like. Anterior part of trunk varying from more or less flattened to strongly flattened body. Snout elongate and tapering. Hind border of pectoral fins extending rearward as far as or further than origin of pelvic fins. Tail stout and not definitely marked off from body. Two well developed dorsal fins and a caudal fin. Caudal fin may or may not with a distinct lower lobe. Denticles over body constitute a row on middle of back.

Species known to occur in Karnataka

1. *Rhynchobatus djiddensis* (Forsskal)(Giant guitarfish)
2. *Glaucostegus grannulatus* Cuvier (Sharpnose guitar fish)

Key to the species

1a. Caudal fin bilobed; first dorsal fin inserted above pelvic fin bases; posterior margins of pectoral fin considerably anterior to pelvic fins origin ..... *R. djeddensis*

1b. Caudal fin not bilobed; first dorsal fin inserted considerably posterior to hind tip of pelvic fins; posterior margins of pectoral fins extend rearward as far or further than origin of pelvic fins ..... *G. granulatus*

Fisheries information : The guitarfishes are of not much economic value. These fishes are found in good number along with the catches of other batoid fishes. *R. djeddensis* is known to grow up to 240 kg. The livers of this fish produce a good quality of liver oil. Its flesh is also considered nourishing when consumed salted or fresh.

Order VIII MYLIOBATIFORMES

Body not shark-like, distinctly depressed, disc-shaped and a slender and long tail almost marked off from the body. Pectoral fins broadly enlarged. Caudal fin absent. No electric organs on head or body present. Skin firm, upper surface covered with denticles.

Key to the families

1a. Eyes and spiracles on sides of head; dorsal fin present ..... MYLIOBATIDAE

1b. Eyes and spiracles on top of head; no distinct dorsal fin 2

2a. Disc extremely broad, more than 1.5 times broader than long; tail slender, shorter than disc width; no buccal papillae on floor of mouth ..... GYMNURIDAE

2b. Disc at least 1.3 times as broad as long; tail (if complete) much longer than disc width; floor of mouth with two or more papillae .. .. DASYATIDAE

Family 17 DASYATIDAE
(Sting rays, Whiprays)

Disc kite-like, flattened, outer front margin of pectoral fins continuous along side of head. A long tail distinct from disc, with one or more long poisonous spines. Dorsal and caudal fin absent. Spiracles large, close posterior to eyes on top of head. Pelvic fins small, inserted below pectoral fins.

Species known to occur in Karnataka

1. *Dasyatis zugei* (Muller & Henle) (Pale-edged sting ray)
2. *Himantura bleekeri* (Blyth) (Whiptail sting ray)
3. *Himantura uarnak* (Forsskal) (Honeycomb sting ray)
4. *Pastinachus sephen* (Forsskal) (Drab sting ray)
5. *Urogymnus asperrimus* (Schneider) (Porcupine ray)

Key to the species

1a. Tail without serrated spine; upper surface of disc profusely covered with tubercles .... *U. asperrimus*

1b. Tail with serrated spine; upper surface of disc sparsely covered with tubercles 2

2a. Tail with a longitudinal cutaneous fold 3

2b. Tail without a longitudianl cutaneous fold 4

3a. Tail with very prominent cutaneous fold (only on lower side), lower tailfold very prominent, its height 2 or 3 times height of tails above fold ..... *P. sephen*

3b. Tail with a short cutaneus fold (on both sides) .....*D. zugei*

4a. Mouth with 4 buccal processes; upper surface of disc brown with bright spotted or marbled pattern .....*H. uarnak*

4b. Mouth with 2 buccal processes; upper sureface of disc brown or grey, without nay bright markings ..... *H. bleekeri*

Fisheries information : The liver of *H. sephen* is utilized for the preparation of liver oil which contains high potency of vitamin A. The flaps of the Sting rays and Whip rays are utilized for the preparation of fishmeal. *H. bleekeri* is seen to be marketed fresh and utilized as human food.

Family 18 GYMNURIDAE
(Butterfly rays)

Disc rhomboic, at least 1.5 times broader than long. Tail conspicuously marked off, slender and shorter than disc; with longitudinal folds on upper and/or lower surface. Some species have spiracular tentacles and one or more long, saw-edged tail spines. Caudal fin absent.

Species known to occur in Karnataka

1. *Gymnura poecilura* (Shaw) (Longtail butterfly ray)

Fisheries information : A common fish but not of any fisheries importance.

Remarks : It is commonly confused with *Gymnura micrura* (Schneider), a name often misapplied to this species following Day (1878) (see Discussion part).

Family 19 MYLIOBATIDAE
(Eagle rays)

Head elevated and conspicuously marked off from disc. Disc rhomboic, much broader than long, its width in adults of different species up to more than 2.5 m. Head distinct with lateral prominent eyes. Spiracles also lateral on head. Anterior subdivision of pectoral fins form a single subrostral lobe. Floor of mouth with several fleshy papillae. Tail long and whip-like and much longer than disc, a serrated spine (or spines) at its base.

Species known to occur in Karnataka

1. *Aetobatus narinar*i (Euphrasen) (Spotted eagle ray)
2. *Aetomylaeus maculatus* (Gray) (Mottled eagle ray)
3. *Aetomylaeus nichofii* (Bloch & Schn.) (Nieuhof's eagle ray)
4. *Rhinoptera javanica* Muller & Henle) (Javanese cownose ray)
5. *Mobula eregoodootenkee* (Bleeker) (Pigmy devil ray)

Key to the species

1a. Head with two widely separated anterior horn-like projections (cephalic fin) resemble ears ..... *M. eregoodootenkee*

1b. Head with one soft fleshy lobe (subrostral lobe) protruding markedly under the head resemble a duck's beak 2

2a. Subrostral lobe divided (bilobed), deeply incised in midline; floor of mouth without papillae; teeth in seven series in both jaws . ..... *R. javanica*

2b. Subrostral lobe undivided; floor of mouth with several fleshy papillae 3

3a. Single series of large teeth only in each jaw; caudal spine present ..... *A. narinari*

3b. Teeth in seven series in each jaw; caudal spine absent 4

4a. Eyes larger, 2.5 times in snout length and 3.2 times in interorbital width; disc with yellowish spots and blotches arranged in transverse bands ..... *A. maculatus*

4b. Eyes smaller, 3.5 times in snout length and 5.0 times in interorbital width; disc with 3 to 5 greyish blue bands, that disappear with age ..... *A. nichofii*

Fisheries information : The eagle rays are generally abundantly found in the commercial catches in our country. These fishes are usually processed for fishmeal. The oil extracted from the livers of these fishes is utilized for smearing boats.

Remarks : These fishes were placed under three

distinct families, *i.e.,* Mobulidae (*Manta* and *Mobula*), Mylobatidae (*Aetobatus* and *Aetomylaeus*) and Rhinopteridae (*Rhinoptera*) by authors. The pigmy devilray, *Mobula eregoodootenkee* (Bleeker), is reported as *Mobula diabolus* (Shaw) (see Discussion part).

Class OSTEICHTHYES

Head with well developed membrane bones such as opercles and suborbitals. Gills covered by bony operculum with one external opening on each side. Endoskeleton bony and firm. Body covered with cycloid or ctenoid scales, obsolete in some or modified into dermal plates. Caudal fin nearly symmetrical.

Key to orders

1a. Body not bilaterally symmetrical, highly flattened; eyes present on one side of body only; dorsal and anal fins long ..... PLEURONECTIFORMES

1b. Body bilaterally symmetrical; eyes present on both sides of body; dorsal and anal fins of variable length 2

2a. Gill openings below or posterior to pectoral fins; first spine of dorsal fin modified into a fishing pole; body globose or depressed ..... LOPHIIFORMES

2b. Gill openings anterior to pectoral fins 3

3a. Body greatly elongate, cylindrical and eel-like; gill openings narrow, on sides of head; fin spines absent ..... ANGUILLIFORMES

3b. Body not so elongate and not eel-like; if eel-like, then either the gill openings not separate from each other but united on ventral side of body near throat, or pelvic fins present, or spiny rays in dorsal and anal fins, or else gill cavity not enlarged 4

4a. Snout considerably elongate, tube-like, with the mouth at the end of tube; pelvic fins, when present, abdominal and without spine ..... SYNGNATHIFORMES

4b. Snout not tubular, but if it resemble a tube then pelvic fins under or not far behind pectoral fins and as a rule with a strong spine 5

5a. Snout beak-like with upper and/or lower jaws greatly prolonged or with enlarged wing-like pectoral fin; lateral line near ventral profile of body ..... BELONIFORMES

5b. Snout not beak-like without prolongation of upper or lower jaw; pectoral fins not greatly elongated, if so not wing-like; lateral line usually on upper part of body 6

6a. Pelvic fins with 2 rays; dorsal and anal fins united with caudal fin ..... OPHIDIIFORMES

6b. Pelvic fins with more than 2 rays; dorsal and anal fins not united with caudal fin 7

7a. Body without scales but a bony head shield often present; barbels well developed, present around mouth; a strong spine at front of dorsal and pectoral fins ..... SILURIFORMES

7b. Body with scales; barbels usually not present, if present poorly developed 8

8a. Mouth very small. Gill openings restricted (small); scales usually modified into spines, shields or plates ..... TETRAODONTIFORMES

8b. Mouth moderate; gill openings normal; scales not modified as above 9

9a. Head generally with well developed spines; cheeks with a bony strut (posterior extension of suborbital bone to preopercle); pectoral fins usually rounded; caudal fin rarely forked ... SCORPAENIFORMES

9b. Head without spines; cheeks without bony strut; pectoral fins not rounded; caudal fin usually forked 10

10a. Head large and depressed; body compressed; fleshy tentacles around mouth; body without scales ..... BATRACHOIDIFORMES

10b. Head not depressed; no tentacles around mouth; body with scales 11

11a. Dorsal and anal fin with spines 12

11b. Dorsal and anal fin without spines 16

12a. Lateral line present 13

12b. Lateral line vestigial or absent 15

13a. Pelvic fin with 5 or less soft rays .... PERCIFORMES

13b. Pelvic fins with 6 or more soft rays 14

14a. Body usually compressed and deep; jaws greatly distensible ..... ZEIFORMES

14b. Body usually elongate; jaws not greatly distensible ..... BERYCIFORMES

15a. First dorsal fin with 4 to 7 weak spines; anal fin with one spine; a characteristic silvery stripe along sides ..... ATHERINIFORMES

15b. First dorsal fin with 4 strong spines; anal fin with 3 spines; no characteristic silvery stripe along sides ..... MUGILIFORMES

16a. Adipose dorsal fin usually present; photophores often present 17

16b. Adipose dorsal fin absent; photophores absent 18

17a. Head lizard-like; sharp, canineform teeth on jaws; anal fin inserted well behind dorsal fin ..... AULOPIFORMES

17b. Head not lizard-like; teeth on jaws small ; anal fin inserted below or close behind dorsal fin ..... MYCTOPHIFORMES

18a. Pelvic fins jugular to thoracic, placed before pectoral fin base ..... GADIFORMES

18b. Pelvic fins always abdominal, placed behind pectoral fin base 19

19a. Lateral line absent on sides of body .... CLUPEIFORMES

19b. Lateral line present on sides of body 20

20a. Branchiostegal rays 3 or 4 .... GONORHYNCHIFORMES

20b. Branchiostegal rays 10 to 35 21

21a. Upper jaw extending beyond eye; mouth terminal or superior ..... ELOPIFORMES

21b. Upper jaw not extending as far as front of eye; mouth inferior ..... ALBULIFORMES

Order IX ELOPIFORMES

Body slender, more or less compressed. Upper jaw extending beyond posterior border of eye. Branchiostegal rays 23 to 35. Gill openings wide; gular plates well developed. Scales cycloid; lateral line developed. Dorsal and anal fins without spine. Pelvic fins abdominal; caudal fin deeply forked and with seven hypurals.

Key to the families

1a. Lateral line with 30 to 40 scales; last dorsal fin ray filamentous ..... MAGALOPIDAE

1b. Lateral line with 95 to 120 scales; last dorsal fin ray not filamentous ..... ELOPIDAE

Family 20 ELOPIDAE
(Lady fish)

Body cylindrical, elongate and fusiform. Mouth terminal, gape of mouth well posterior to hind margin of orbit. A fairly large bony gular plate present between the arms of the lower jaw. Dorsal fin with 20 to 25 unbranched soft rays, last ray not elongated; inserted almost middle of the body. Anal fin with 18 to 20 rays, inserted considerably posterior to dorsal fin. Lateral line with 95 to 120 scales.

Species known to occur in Karnataka

1. *Elops machnata* (Forsskal) (Lady fish)

Fisheries information : The ladyfishes are generally abundantly found in the east coast of our country. These fishes are of minor commercial importance. It grows to a fairly large size, up to 90 cm SL.

Family 21 MEGALOPIDAE
(Tarpons)

Body more or less compressed and almost

deep. Mouth terminal or superior, its gape not extending to hind border of the orbit. A bony gular plate present below mouth between the arms of lower jaw. Dorsal fin with 13 to 21 unbranched soft rays, the last ray elongated and filamentous. Anal fin with 22 to 31 soft rays, inserted slightly behind last dorsal fin ray. Lateral line with 30 to 40 scales.

Species known to occur in Karnataka

1. *Megalops cyprinoides* (Broussonet) (Indo-Pacific tarpon)

Fisheries information : *M. cyprinoides* is a carnivorous and fast growing fish. It occurs in both the coasts of our country and can cause serious destruction to the cultivable species in culture ponds.

Order X ALBULIFORMES

Body usually herring-like. Gullar plates absent or reduced to thin median splint. Mandibular sensory canal lying in an open groove in the dentary and angular bones. Mouth inferior; snout projecting beyond mouth. Upper jaw not extending as far as front of eye. Infraorbital lateral line extending onto premaxilla.

Family 22 ALBULIDAE
(Bonefishes)

Body elongate, fusiform. It resembles clupeioid fishes but posses a lateral line containing 66 to 84 scales. Snout conical, projecting beyond tip of lower jaw; mouth inferior. Bony gular plate between the arms of lower jaw small and often overlooked. Branchiostegal rays 10 to 16. Fins without spines. A single dorsal fin with 16 to 21 rays. Pelvic fin with 10 to 14 rays. Gillrakers 15 to 17. Head scaleless, body scales small.

Species known to occur in Karnataka

1. *Albula vulpes* (Linnaeus) (Bonefish)

Fisheries information : An edible fish, but with numerous fine bones. Occasionally forms a part of commercial catches.

Order XI ANGUILLIFORMES

Body very elongate, snake-like. Pelvic fins and its supporting skeleton absent. Pectoral fins present, reduced or absent. Gill openings usually narrow; gill rakers absent. Dorsal and anal fins long and low, usually confluent with caudal fin. Scales usually absent, if present, minute cycloid scales embedded in skin. Lateral line usually present, obsolete in some.

Key to the families

1a. Body with minute embedded scales .... ANGUILLIDAE

1b. Body without scales 2

2a. Large canine teeth (generally fang-like) present on vomer (medially on roof of mouth) 3

2b. Vomer without large canine teeth 4

3a. Well developed pectoral fins present .... MURAENESOCIDAE

3b. Pectoral fins absent ..... MURAENIDAE

4a. Gape of mouth generally extending to orbits; pectoral fins present or absent; branchiostegal rays overlapping midventrally; posterior nostrils openings inside mouth, on upper lip or just above mouth ..... OPHICHTHIDAE

4b. Gape of mouth never extending to orbits; pectoral fins always present; branchiostegal rays not overlapping ventrally; posterior nostrils not labial, but lateral or superior .... CONGRIDAE

Family 23 ANGUILLIDAE
(Freshwater eels)

Body eel-like, cylindrical anteriorly with minute embedded scales. Mouth terminal or slightly oblique, gape never extending posteriorly much beyond orbits. Gill slits vertical, below origin of pectoral fins. Fins without spines. Dorsal and anal fins confluent with caudal fin. Dorsal fin inserted variously between pectoral fins and vent or over vent, in anterior part of body. Pelvic fins

absent. Pectoral fins well developed. Lateral line system present but not conspicuous, typically a series of minute, white pores. Usually freshwater eels are catadromous fishes.

Species known to occur in Karnataka

1. *Anguilla bengalensis bengalensis* (Gray) (Long-finned eel)
2. *Anguilla bicolor bicolor* McClelland (Short-finned eel)

Key to the species

1a. Dorsal fin inserted above vent or almost near to it ..... *A. bicolor bicolor*

1b. Dorsal fin inserted above about middle of gill slits and vent .... *A. bengalensis bengalensis*

Fisheries information : *A. bengalensis bengalensis* is one of the most important commercial eels and fairly abundant along both the coasts of our country. *A. bicolor bicolor* appears not so much commonly found like the former. There is a good export market for both live elvers as well as eels.

Remarks : *A. bengalensis bengalensis* has been reported as *Anguilla nabulosa* McClelland from Karnataka coast.

Family 24 MURAENIDAE
(Morray eels)

Body cylindrical and eel-like, almost compressed along tail. Body without scales. Mouth wide, maxilla extending well behind the orbits. Teeth usually sharp, mostly raptorial but sometimes molar-like. Teeth on vomer uniserial or in a median multiserial patch. Gill slits restricted to small roundish lateral openings. Fins without spines. Dorsal and anal fins confluent posteriorly with the caudal fin. Pectoral and pelvic fins absent.

Species known to occur in Karnataka

1. *Echidna nebulosa* (Ahl) (Starry moray)
2. *Gymnothorax meleagris* (Shaw and Nodder) (Turkey morray)
3. *Gymnothorax picta* (Ahl) (Painted moray)
4. *Gymnothorax pseudothyrsoideus* (Bleeker) (Highfin moray)
5. *Strophidon sathete* (Hamilton) (Slender giant eel)

Key to the species

1a. Teeth mostly blunt, some even molor-like, particularly those on roof of mouth .... *E. nebulosa*

1b. Teeth sharp, some of them fang-like or shark-like 2

2a. Lateral jaw teeth without serrations; head and trunk combined 1.5 to 2.0 times in tail; head 3.0 times in trunk ..... *S. sathete*

2b. Lateral jaw teeth with some serrations on their margins; head and trunk combined less than 1.5 times in tail; head less than 3.0 times in trunk 3

3a. Tail slightly shorter than trunk; body light brownish, mottled with pale specks on upper half of body and on high dorsal fin .... *G. pseudothryrsoideus*

3b. Tail equal or longer than trunk; body grayish or whitish or blackish, mottled with minute dark specks on whole body 4

4a. Teeth in upper jaw in one row; body grayish or whitish, with fine dots ..... *G. pictus*

4b. Teeth in upper jaw in two rows; body black with numerous small yellow (white on preservation) spots ..... *G. meleagris*

Fisheries information : The moray eels are of no commercial value.

Remarks : *Thyrsoidea macrura* (Bleeker), as reported fron Karnataka, is considered as a junior synonym of *Strophidon sathete* (Hamilton) (Bohlke, 1997).

Family 25 CONGRIDAE
(Conger eels)

Body eel-like and cylindrical, generally with a

thin, delicate tail region which is readily damaged and body without scales. Mouth usually slightly inferior but sometimes terminal. Maxilla never extending beyond the orbits. Teeth on vomer typically in a triangular or oval, multiserial patch but may also be uniserial. Nostrils separated, the anterior one is not tubular; the posterior nostril lateral or superior, as a simple aperture anterior to eyes. Gill slits ahead of pectoral fins. Dorsal and anal fins continuous around tail. Dorsal fin inserted almost above gill openings. Pectoral fins present but pelvic fins absent.

Species known to occur in Karnataka

1. *Uroconger lepturus* (Richardson) (Slender conger eel)

Fisheries information : This is a common congrid eel in our coast and of minor commercial value. Often used as fish bait and sometimes consumed by poor.

Family 26 MURAENESOCIDAE
(Pike congers)

Body cylindrical, eel-like without scales and with compressed tail. Mouth terminal, maxilla extending well beyond the orbits. Snout very pointed. Teeth large, prominent especially in front; sharp, multiserial on jaws and typically in 3 rows on vomer; a median row of canines flanked on each side by a row of much smaller teeth. Gill slits large, vertical or oblique anterior to pectoral fins. Dorsal fin inserted almost above gill slits. Dorsal and anal fins united with caudal fin. Pectoral fins present but pelvic fins absent. Fins without spines.

Species known to occur in Karnataka

1. *Congresox talabonoides* (Bleeker) (Indian pike conger)
2. *Muraenesox bagio* (Hamilton) (Common pike conger)
3. *Muraenesox cinereus* (Forsskal) (Daggertooth pike conger)

Key to the species

1a. Largest teeth on lower jaw conical, not laterally compressed, very sharp, without basal bulges, but with slightly swollen tips, directed outward; principal teeth on vomer similar but sometimes with weak basal bulges in juveniles ..... *C. talabonoides*

1b. Largest teeth on lower jaw laterally compressed, sharp, with conspicuous anterior and posterior basal bulges, erect; principal teeth on vomer similar to jaw teeth 2

2a. Interorbital width 10 to 11 times in head; lateral line pores 33 to 39 before anus; dorsal fin rays 47 to 59 before level of anus .... *M. bagio*

2b. Interorbital width about 8 times in head; lateral line pores 39 to 47 before anus; dorsal fin rays 66 to 78 before level of anus .... *M. cinereus*

Fisheries information : Pike congers are commercially most important among eels and *M. bagio* is the most common pike conger.

Family 27 OPHICHTHIDAE
(Snake or worm eels)

Body cylindrical, snake-like or worm-like. Body without scales. Mouth terminal or inferior, maxilla generally extending posterior to the orbits. Teeth on jaws highly variable, strong and fang-like or small and pointed or blunt and granular; teeth on vomer either in 1 to 3 or in a solid patch. Gill openings small, slit-like or rounded. Fins without spines. Dorsal and anal fins, when present, continuous around the tail externally, or discontinuous, with the caudal fin rays reduced. Pectoral fins either present or absent. Pelvic fins absent.

Species known to occur in Karnataka

1. *Lamnostoma orientalis* (McClelland) (Oriental worm-eel)
2. *Neenchelys buitendijki* Weber & de Beaufort (Spotted worm-eel)

Key to the species

1a. A fringe of fin around the tip; pectoral fins present; gill openings mid-lateral; posterior nostril an elongate slit before lower margin of eye, without flap ..... *N. buitendijki*

1b. Tip of tail finless; pectoral fins absent; gill opening entirely ventral; posterior nostril before eye with a pendulous flap .... *L. orientalis*

Fisheries information : The snake eels are of little commercial value. *L. orientalis* is a very common species generally abundant in the East Coast of our country.

Order XII CLUPEIFORMES

Body usually compressed and covered with cycloid scales. Jaws not protrusible. Teeth small or absent. Branchiostegal rays fewer than 15. Dorsal and anal fins without spines. Abdomen often with hardened scutes along midventral line. Gill rakers numerous.

Key to the families

1a. Teeth on jaws fang-like canines; dorsal fin origin over anal fin origin, well behind midpoint of body; abdomen without scutes ..... CHIROCENTRIDAE

1b. Teeth on jaws minute or absent; dorsal fin origin well ahead of anal fin origin, before or at about midpoint of body; abdomen usually with scutes 2

2a. Mouth inferior; snout projecting infront of lower jaw; maxilla reaching well beyond posterior margin of eye .... ENGRAULIDIDAE

2b. Mouth terminal or subterminal; snout usually not projecting infront of lower jaw; maxilla not reaching beyond eye 3

3a. Anal fin with more than 30 rays; lower jaw projecting ..... PRISTIGASTERIDAE

3b. Anal fin with less than 30 rays; lower jaw usually not projecting ..... CLUPEIDAE

Family 28 CLUPEIDAE
(Herrings, Sardines)

Body fusiform with a complete series of scutes along the abdomen (pelvic scutes always present). Mouth terminal with minute or small jaw teeth. Dorsal fin short, inserted almost near middle of body. Anal fin short, inserted well behind the dorsal fin. Pelvic fins inserted anterior, below or just posterior to dorsal fin. Body with 40 to 50 scales in lateral series.

Species known to occur in Karnataka

1. *Amblygaster sirm* (Walbaum) (Spotted sardinella)
2. *Amblygaster leiogaster* (Valenciennes) (Smooth-belly sardinella)
3. *Anodontostoma chacunda* (Hamilton) (Chacunda gizzard shad)
4. *Dussumieria acuta* Valenciennes (Rainbow sardinella)
5. *Dussumieria elopsoides* Bleeker (Slender Rainbow sardinella)
6. *Escualosa thoracata* Valenciennes (White sardine)
7. *Herklotsichthys quadrimaculatus* (Ruppell)
8. *Hilsa kelee* (Cuvier) (Kalee shad) (Bluestripe herring)
9. *Nematalosa galatheae* Nelson & Rothman (Galathea gizzard shad)
10. *Nematalosa nasus* (Bloch) (Bloch's gizzard shad)
11. *Sardinella albella* (Valenciennes) (White sardinella)
12. *Sardinella fimbriata* (Valenciennes) (Fringescale sardinella)
13. *Sardinella gibbosa* (Bleeker) (Goldstripe sardinella)
14. *Sardinella jusieu* (Valenciennes) (Mauritian sardinella)
15. *Sardinella longiceps* Valenciennes (Indian oil sardine)

16. *Sardinella melanura* (Cuvier) (Blacktip sardinella)
17. *Spartelloides delicatulus* (Bennett) (Delicate round herring)
18. *Spartelloides gracilis* (Schlegel) (Silver-stripe round herring)
19. *Tenualosa ilisha* (Hamilton) (Hilsa shad)
20. *Tenualosa toli* (Valenciennes) (Toli shad)

Key to the species

1a. Pelvic scute W-shaped; no other scutes along belly 2

1b. Pelvic scute with ascending arms; scutes present anterior and posterior to pelvic fins 5

2a. Branchiostegal rays 11 to 18 3

2b. Branchiostegal rays 4 to 8 4

3a. Posterior part of scales with many small radiating striae; lateral scale series 40 to 45; body depth 3.4 to 4.5 in standard length ..... *D. acuta*

3b. Posterior part of scales without striae; lateral scale series 52 to 55; body depth 4.5 to 6.2 in standard length ..... *D. elopsoides*

4a. A bright and distinct silvery midlateral stripe present; scales in lateral series 42 to 48 ..... *S. gracilis*

4b. No silvery band, but whole flanks silvery; scales in lateral series 35 to 41 ..... *S. delicatulus*

5a. Lower jaw flared outward; mouth generally inferior; last dorsal fin ray filamentous in many species 6

5b. Lower jaw normal; mouth terminal; last dorsal fin ray normal 8

6a. Last dorsal fin ray normal, not filamentous ..... *A. chacunda*

6b. Last dorsal fin ray produced, filamentous 7

7a. A pair of grooves in the spongy skin on top of head, converging posteriorly; posterior border of scales not toothed; a dark shoulder spot and a series of spots behind it ..... *N. galatheae*

7b. No grooves in the spongy skin on top of head; posterior border of scales toothed; a dark shoulder spot, but devoid of spots behind it *N. nasus*

8a. Upper jaw with a distinct median notch or cleft when seen from front 9

8b. Upper jaw rounded when seen from front 11

9a. Fronto-parietal striae (on top of head) many (8 to 14); gillrakers on inner arches distinctly curled outward; scales perforated ..... *H. kelee*

9b. Fronto-parietal striae weakly developed, generally hidden by skin; gillrakers on inner arches straight; scales not perforated 10

10a. Head length 28 to 32% of standard length; gillrakers numerous, almost 100 to 250 on lower arm of first arch; caudal fin as long as head length; a dark blotch behind gill openings, followed by a series of small spots along flank ..... *T. ilisha*

10b. Head length 25 to 27% of standard length; gillrakers fewer, 60 to 100 on lower arm of first arch (barely more after 10 cm standard length); caudal fin shorter than head length; a dark diffuse mark behind gill opening, no other spots on flank ..... *T. toli*

11a. Hind margin of gill opening evenly rounded, without fleshy outgrowth; pelvic fin rays 7 ..... *E. thoracata*

11b. Hind margin of gill opening with two fleshy outgrowths; pelvic fin rays 8 or 9 12

12a. Fronto-parietal striae few, 3 to 8; lower portion of paddle-shaped second supramaxilla longer than upper ..... *H. quadrimaculatus*

12b. Fronto-parietal striae usually many, 8 to 19; lower portion of paddle-shaped second supramaxilla equal to upper 13

13a. Gillrakers 31 to 43; predorsal scales forming a well-defined single median row 14

13b. Gillrakers usually more than 40 (mostly 45 to 90, but over 200 in some); predorsal scales paired and overlapping in midline 15

14a. Gillrakers 33 to 43; a series of 10 to 20 gold (in life) or black (on preservation) spots down the flanks ..... *A. sirm*

14b. Gillrakers usually 31 to 33; no spots on flanks ..... *A. leiogaster*

15a. Pelvic fin with 9 rays; pseudobranch long, with distinct ventral ridge; epibranchial gillrakers curled upwards; lower gillraker on first arch 145 to 258 ..... *S. longiceps*

15b. Pelvic fin with 8 rays. Pseudobranch short, flat; epibranchial gillrakers almost straight; lower gillraker on first arch not more than 130 16

16a. Caudal fin tips jet black; lower gillrakers 38 to 74 (at 75 to 100 mm standard length); abdominal scutes usually 16 to 17 + 12 to 13 ..... *S. melanura*

16b. Caudal fin tips plain, at most caudal fin margin dusky; lower gillrakers 43 to 132.. 17

17a. Post-pelvic scutes 12 to 14 (rarely 11 or 15); total scutes 29 to 32 18

17b. Post-pelvic scutes usually 15 (less common 14, rarely 13); total scutes 32 to 34..... 19

18a. Lower gillrakers on first arch 40 to 67 (50 to 130 mm standard length); perforations on hind part of scale more, at middle ½ of scale ..... *S. albella*

18b. Lower gillrakers on first arch 53 to 82 (50 to 130 mm standard length); perforations on hind part of scale fewer, at middle $^1/_4$of scale ..... *S. fimbriata*

19a. Gillrakers 88 to 102 (at 90 mm standard length) on lower arm of first arch..... ..... *S. jusieu*

19b. Gillrakers 38 to 65 (at 40 to 170 mm standard length) on lower arm of first arch..... ..... *S. gibbosa*

Fisheries information : The herrings and sardines are very important commercial fishes. These fishes are abundant throughout Indian coast. *T. ilisha* is one of the very important commercial fishes of our country. It is a well known anadromous migratory fish, entering all the major river systems of India.

Remarks : Reports of *Dussumieria hasselti* Bleeker is referable to *D. elopsoides* (Bleeker), *Kowala coval* (Cuvier) is to *Escualosa thoracata* Valenciennes, *Macrura kelee* (Cuvier) is to *Hilsa kelee* (Cuvier), *Sardinella dayi* Regan is to *S. jusieu* (Valenciennes) and *Hilsa ilisha* is to *Tenualosa ilisha* (Hamilton) (Whitehead, 1985).

Family 29 PRISTIGASTERIDAE
(Pristigasterids)

Body more or less compressed, abdomen with sharp median keel of scutes. Mouth moderate, terminal; lower jaw projecting. Teeth in jaws very small. Dorsal fin short, inserted ahead of middle of body in deep forms, but behind in elongate forms and sometimes missing (in *Raconda*). Anal fin long, with more than 30 rays. Pelvic fin with 6 or 7 rays or entirely absent. Body with 35 to 55 thin and easily shade scales in the lateral series.

Species known to occur in Karnataka

1. *Pellona ditchela* Valenciennes (Indian pellona)
2. *Ilisha elongata* (Bennett) (Elongate ilisha)
3. *Ilisha filigera* (Valenciennes) (Coromondel ilisha)
4. *Ilisha megaloptera* (Swainson) (Bigeye ilisha)
5. *Ilisha melastoma* (Schneider) (Indian ilisha)
6. *Ilisha sirishai* Seshagiri Rao (Lobejaw ilisha)

7. *Ilisha striatula* Wongratana (Banded ilisha)
8. *Opisthopterus tardoore* (Cuvier) (Long-finned herring)
9. *Raconda russelliana* Gray (Russell's smooth back herring)

Key to the species

1a. Dorsal and pelvic fins absent; anal fin very long with 81 to 92 rays ..... *R. russeliana*

1b. Dorsal fin present and pelvic fins either present or absent; anal fin not very long with 34 to 65 rays 2

2a. Anal fin long with 51 to 65 rays; pelvic fins absent ..... *O. tardoore*

2b. Anal fin moderate with 34 to 53 rays; pelvic fins present 3

3a. Toothed hypomaxilla present; abdominal scutes 26 to 28 ..... *P. ditchela*

3b. Toothed hypomaxilla absent; abdominal scutes 30 or more 4

4a. No tube or a very short tube at posterior end of swimbladder that not passing backward into muscle ..... *I. sirishai*

4b. One or two tubes from posterior end of swimbladder passing back into muscle 5

5a. Swimbladder with one post coelomic extension on right side of body 6

5b. Swimbladder with two post coelomic extensions 8

6a. Total abdominal scutes 30 to 32 ..... *I. megaloptera*

6b. Total abdominal scutes 34 to 42 7

7a. Body depth 2.8 to 3.2 times in standard length; pectoral fin tip reaching pelvic fin base ..... *I. filigera*

7b. Body slender, its depth 3.3 to 3.7 times in standard length; pectoral fin tip not reaching pelvic fin base (in adults) ..... *I. elongata*

8a. Vertical striae on scales traversing whole scale or overlapping across center of scale; 21 to 24 gillrakers on lower limb of first gill arch ..... *I. melastoma*

8b. Vertical striae on scales not continuous, but with a distinct gap across center of scale; 27 to 28 gillrakers on lower limb of first gill arch ..... *I. striatula*

Fisheries information : The fishes of this family are of little commercial value due to less flesh and more bone.

Remarks : Record of *Euplatygaster indica* (Swainson) is referable to *Ilisha melastoma* (Schneider).

Family 30 ENGRAULIDAE
(Anchovies)

Body cylindrical, usually fusiform and sometimes greatly compressed (body tapering to a point in the Grenadier anchovies, *Coilia*). Abdomen generally with scutes. Snout prominent and generally 'pig-like' and projecting. Mouth conspicuously inferior. Posterior tip of maxilla extending far, sometimes projecting beyond operculum. Fins without spines. Pectoral fins inserted low on body, sometimes with free upper rays or filamentous rays. Dorsal fin generally short and inserted at midpoint of body. Caudal fin generally forked but sometimes tapering to a point. Body sometimes with light organs along sides.

Species known to occur in Karnataka

1. *Coilia dussumieri* Valenciennes (Gold-spotted grenadier anchovy)
2. *Coilia neglecta* Whitehead (Neglecta grenadier anchovy)
3. *Encrasicholina devisi* (Whitley) (Devis' anchovy)
4. *Encrasicholina puntifer* Fowler (Buccaneer anchovy)
5. *Stolephorus commersonii* (Lacepede) (Commerson's anchovy)
6. *Stolephorus indicus* (van Hasselt) (Indian anchovy)

7. *Stolephorus insularis* Hardenberg (Hardenberg's anchovy)
8. *Stolephorus waitei* Jordan and Seale (Spotty anchovy)
9. *Thryssa dayi* Wongratana (Day's thryssa)
10. *Thryssa dussumieri* (Valenciennes) (Dussumier's thryssa)
11. *Thryssa hamiltonii* (Gray) (Hamilton's thryssa)
12. *Thryssa malabarica* (Bloch) (Malabar thryssa)
13. *Thryssa mystax* (Schneider) (Moustached thryssa)
14. *Thryssa polybranchialis* Wongratana (Hump-head thryssa)
15. *Thryssa purava* (Hamilton) (Oblique jaw thryssa)
16. *Thryssa setirostris* (Broussonet) (Long jaw thryssa)
17. *Thryssa vitrirostris* (Gilchrist & Thompson) (Orange mouth thryssa)

Key to the species

1a. Body tapering, "rat tailed"; caudal fin small, rhomboid; anal fin long, confluent with caudal fin; six upper pectoral fin rays unbranched and free from each other 2

1b. Body normal, not tapering or rat tailed; caudal fin large, forked; anal fin short not confluent with caudal fin; upper pectoral fin rays not free from each other 3

2a. Longitudinal rows of pearl spots (light organs) on flanks of body present ..... *C. dussumieri*

2b. Pearly spots on flanks of body absent ..... *C. neglecta*

3a. Only needle-like prepelvic scutes present; anal fin short, with less than 25 rays 4

3b. Prepelvic and post pelvic scutes present; anal fin long, with more than 25 rays 9

4a. Isthmus muscle not reaching to posterior border of gill membrane; urohyal exposed 5

4b. Isthmus muscle reaching to and beyond gill membrane; urohyal not exposed 6

5a. Maxilla tip pointed, projecting beyond second supramaxilla and reaching to suboperculum ..... *E. devisi*

5a. Maxilla tip blunt, scarcely projecting beyond second supramaxilla, not reaching to front edge of preoperculum ..... *E. punctifer*

6a. Posterior margin of preoperculum indented near maxilla tip; a double pigment line on back behind dorsal fin ..... *S. insularis*

6b. Posterior margin of preoperculum evenly rounded near maxilla tip; no double pigment line on back behind dorsal fin 7

7a. Maxilla tip reaching to or only just beyond anterior border of preopercle; pelvic fin tips failing to reach vertical from dorsal fin origin. ..... *S. indicus*

7b. Maxilla tip reaching to or beyond posterior margin of preopercle 8

8a. Pelvic fin tips reaching beyond dorsal fin origin; a double pigment line on back ahead of dorsal fin ..... *S. commersonii*

8b. Pelvic fin tips not reaching to dorsal fin origin; no dark lines on back ahead of dorsal fin .. .. *S. waitei*

9a. Maxilla reaches beyond pectoral fin tip; lower jaw with high coronoid process .... *T. setirostris*

9b. Maxilla not reaching pectoral fin tip; lower jaw slender 10

10a. Maxilla long, reaching to pectoral fin base or beyond 11

10b. Maxilla short, not reaching to pectoral fin base 14

11a. Branched anal rays 41 to 46 (mostly 42 to 44); no distinct black spot behind upper part of gill opening ..... *T. dayi*

11b. Branched anal rays less than 41; a distinct black blotch behind upper part of gill opening 12

12a. Lower gill rakers 13 to 16 on first arch, the serrae not clumped ..... *T. mystax*

12b. Lower gill rakers 16 to 24 on first arch, the serrae in distinct clump 13

13a. Maxilla reaching at least half way along pectoral fin length; post pelvic scutes 6 to 9; anterior supramaxilla absent; lower gillrakers 17 to 19 (rarely 20)..... *T. dussumieri*

13b. Maxilla shorter, reaching up to 1/3 along pectoral fin length; post pelvic scutes 8 to 12; anterior supramaxilla present; lower gillrakers 18 to 24 (usually 20 to 23)..... ..... *T. vitrirostris*

14a. Lower gillrakers on first arch 11 to 15 .... *T. hamiltoni*

14b. Lower gillrakers on first arch 17 to 27 15

15a. Lower gillrakers 25 to 27 .... *T. polybranchialis*

15a. Lower gillrakers 17 to 21 16

16a. Branched anal fin rays 38 to 44; enlarged teeth on lower jaw only ..... *T. purava*

16a. Branched anal fin rays 33 to 38; teeth in both jaws small ..... *T. malabarica*

Fisheries information : Fishes of of this family are of minor commercial value due to less flesh and more bone.

Remarks : Report of *Engraulis telera* (Day) from Karnataka coast needs further confirmation (see Discussion).

Family 31 CHIROCENTRIDAE
(Wolf herrings)

Body greatly elongate and compressed with small, cycloid scales. Jaws with fang-like teeth. Dorsal fin with 16 to 19 rays, inserted posterior to middle of body. Anal fin with 32 to 35 rays, inserted below vertical from front of dorsal fin base. Pectoral fins inserted low on body, with 13 to 15 rays. Pelvic fins with 6 to 7 rays, inserted about at the middle of pectoral fin base and origin of anal fin. Fins without spines. Caudal fin deeply forked.

Species known to occur in Karnataka

1. *Chirocentrus dorab* (Forsskal) (Dorab wolf-herring)
2. *Chirocentrus nudus* Swainson (Whitefin wolf herring)

Key to the species

1a. Upper part of dorsal fin black; pectoral fin length almost equal to length from center of eye to posterior border of operculum..... ..... *C. dorab*

1b. Dorsal fin white or colourless; length of pectoral fin longer than length from center of eye to posterior border of operculum..... ..... *C. nudus*

Fisheries information : *C. nudus* contributes 80% of the total catch of the wolf herrings. *C. dorab* is found in both the coasts but 76% of the catch comes from the east coast of our country.

Order XIII GONORYNCHIFORMES

Mouth small, terminal; maxilla short and jaws toothless. Suprabranchial organ present. First three vertebrae specialized and associated with one or more cephalic ribs.

Family 32 CHANIDAE
(Milkfish)

Body elongate and almost compressed with small cycloid scales. Mouth small and terminal. Maxilla extending to middle of the orbit. Gular plate absent in between the arms of the lower jaw. Dorsal fin with 13 to 17 rays, inserted almost in the middle of body. Anal fin with 9 to 11 rays, inserted close to caudal fin. Dorsal fin and anal fins with basal sheath of scales. Pelvic and pectoral bases with large axillary scales. Fins without

spines. Caudal fin deeply forked. Lateral line present.

Species known to occur in Karnataka

1. *Chanos chanos* (Forsskal) (Milkfish)

Fisheries information : The milkfish can be cultured in the tanks and ponds where the water is slightly saline. It is an important commercial fish, found in both the coasts of our country.

Order XIV SILURIFORMES

Body elongate with barbels around mouth. Skin usually naked or in some, covered with bony plates. Dorsal and pectoral fin preceeded by a strong spine. Adipose dorsal fin often present. Maxilla rudimentary. Anterior four vertebrae joined together, with a chain of small bones connecting air bladder and weberian oscicle.

Key to the families

1a. Dorsal and anal fins long based and united with the caudal fin; barbels 4 pairs; adipose dorsal fin absent ..... PLOTOSIDAE

1b. Dorsal and anal fins small and not united with the caudal fin; barbels 1 to 3 pairs; adipose dorsal fin present ..... ARIIDAE

Family 33 PLOTOSIDAE
(Eel catfishes)

Body elongate, almost eel-like without scales, tapering to a point posteriorly. Barbels 4 pairs, nasal and maxillary one pair each and mental 2 pairs. Dorsal fin two, first fin with 1 serrated spine and 4 to 6 soft rays and second fin with 69 to 143 soft rays. Pectoral fins with 1 serrated spine and 9 to 16 soft rays. Pelvic fins with 10 to 16 soft rays. Anal fin with 58 to 131 rays. Caudal fin united with second dorsal and anal fins.

Species known to occur in Karnataka

1. *Plotosus canius* Hamilton (Eel catfish)
2. *Plotosus limbatus* Valenciennes (Darkfin eel catfisih)
3. *Plotosus lineatus* (Thunberg) (Striped eel catfish)

Key to species

1a. Body generally with 2 or 3 pale lateral stripes; maxillary barbels extending almost posterior to orbits ..... *P. lineatus*

1b. Body without any stripes; maxillary barbels extending to or beyond opercular margin 2

2a. Eyes smaller, 7 to 12% in head length; nasal barbels extending well behind eyes .... *P. canius*

2b. Eyes larger, 13 to 20% in head length; nasal barbels shorter, extending only as far as hind border of eyes or slightly beyond .... *P. limbatus*

Fisheries information : The dorsal and pectoral fin spines of the eel catfishes contain venomous glands, therefore, great care has to be taken while handling these fishes. Death may even result during careless handling of these fishes.

Family 34 ARIIDAE
(Sea catfishes)

Body elongate without scales. Head covered with plates. Teeth on palate villiform or conical, granular or molar-like, arranged in 1 to 3 patches on each side of palate. Barbels generally 1 to 3 pairs, nasal barbels absent. Dorsal and pectoral fin preceeded by a strong spine. A short adipose dorsal fin present. Caudal fin forked.

Species known to occur in Karnataka

1. *Arius arius* Hamilton (Threadfin sea catfish)
2. *Arius jella* Day (Blckfin sea catfish)
3. *Arius maculatus* (Thunberg) (Spotted sea catfish)
4. *Arius subrostratus* Valenciennes (Shovelnose sea catfish)
5. *Arius sumatranus* Bennett (Goat sea catfish)
6. *Batracocephalus mino* (Hamilton) (Beardless sea catfish)
7. *Hemiarius sona* (Hamilton) (Sona sea catfish)
8. *Hexanematichthys sagor* (Hamilton) (Sagor sea catfish)

9. *Nemapteryx caelata* (Valenciennes) (Engraved sea catfish)
10. *Netuma thalassina* (Ruppell) (Giant sea catfish)
11. *Osteogeneiosus militaris* (Linnaeus) (Soldier sea catfish)
12. *Plicofolis platystomus* (Day) (Flat mouth sea catfish)
13. *Plicofollis dussumieri* (Valenciennes) (Black-tip sea catfish)
14. *Plicofollis tenuispinis* (Day) (Thinspine sea catfish)
15. *Plicofollis tonggol* (Bleeker) (Roughback sea catfish)

Key to the species

1a. Barbels only one or two pairs 2

1b. Barbels three pairs 3

2a. Lower jaw longer than upper jaw; maxillary barbel absent; mental barbels soft, minute and rudimentary (*Batrachocephalus*) .....*B. mino*

2b. Lower jaw equal to or shorter than upper jaw; maxillary barbel present, hard and bony; mental barbels absent (*Osteogeneiosus*) ....*O. militaris*

3a. Adipose fin long, its base as long as anal-fin base (*Hemiarius*) .....*H. sona*

3b. Adipose fin short, its base about half or less than half of anal-fin base 4

4a. Lateral line not bifurcated at caudal region 5

4b. Lateral line bifurcated at caudal region 6

5a. Palatine teeth in two patches, placed side by side, inner patch oval and outer patch triangular, on each side (*Hexanemichthys*) . .....*H. sagor*

5b. Palatine teeth in one triangular patch on each side (*Nemapteryx*) .....*N. caelata*

6a. Adipose fin very short, its base less than ½ of anal-fin base 7

6b. Adipose fin moderately long, its base about ½ of anal-fin base (*Arius*) 11

7a. Roof of mouth with three patches of conical or viliform teeth, that joined in adults to form a large triangular patch on each side (*Netuma*) .....*N. thalassina*

7b. Roof of mouth with 1 or 2 patches of granular or molar-like teeth on each side (*Plicofolis*) 8

8a. Roof of mouth with a single patch of teeth on each side 9

8b. Roof of mouth with two patches of teeth, a larger patch below a small patch on each side 10

9a. Snout duck-bill shaped; barbels fleshy; palatine tooth patch oval or pyriform-shaped, placed at anterior part of buccal cavity ....*P. platystomus*

9b. Snout not duck-bill shaped; barbels not fleshy; palatine tooth patch shoe-shaped, placed far back in buccal cavity..... *P. tenuispinis*

10a. Posterior patches of palatine teeth elliptical, diverging posteriorly; distinct preorbital protuberance of lateral ethmoid present ....*P. dussumieri*

10b. Posterior patches of palatine teeth pear-shaped, converging posteriorly; preorbital lateral ethmoidal protuberance absent .... *P. tonggol*

11a. Palatine teeth as a oval small patch 12

11b. Palatine teeth as an elliptical, large patch.. 13

12a. Snout long, spatulate; maxillary barbels short, not extending beyond orbit; palatine teeth patch sparsely packed.....*A. subrostratus*

12b. Snout short, obtusely rounded; maxillary barbels long, extending beyond orbit; palatine teeth patch densely packed ....*A. sumatranus*

13a. Tooth patches on palate fully elliptical, well

formed, with densely packed teeth, inner margins almost straight ..... *A. maculatus*

13b. Tooth patches on palate irregularly ovate, not fully formed, with loosely packed teeth, inner margins not straight 14

14a. Anal fin rays 20 to 22; first dorsal fin ray usually prolonged ..... *A. arius*

14b. Anal fin rays 17 or 18; first dorsal fin rays not prolonged ..... *A. jella*

Fisheries information : Sea catfishes are one of the important groups of marine commercial fishes. These are caught by all kinds of gears, mostly by hook and line, and mostly consumed fresh. The air bladder is used in manufacture of isinglass.

Remarks : *Arius crossocheilus* Bleeker is relegated to synonymy of *Plicofollis tonggol* (Bleeker) (Ferraris, 2007). The generic allocations considered here are following Marceniuk and Menezes (2007) and Ferraris (2007).

Order XV AULOPIFORMES

Head usually lizard-like. Sharp canine teeth on jaws. Dorsal fin insertion well in advance of anal fin insertion. Adipose dorsal fin present. Fins without spines. Second pharyngobranchial greatly elongated posterolaterally, extending away from third pharyngobranchial, with elongated uncinate process of second epibranchial contacting third pharyngobranchial, and third pharyngobranchial lacking cartilaginous condyle for articulation of second epibranchial. Photophores (light producing organs) often present. Caudal fin forked.

Key to families

1a. Mouth lizard-like; upper jaw extending beyond level of middle of orbits; supramaxilla small or absent ..... SYNODONTIDAE

1b. Mouth not lizard-like; upper jaw not extending beyond level of middle of eyes; supramaxilla single, elongate ..... CHLOROPHTHALMIDAE

Family 35 CHLOROPHTHALMIDAE (Greeneyes)

Body elongate, compressed posteriorly, more or less rounded in cross section anteriorly. Eyes large, pupil keyhole shaped. Dorsal fin single, with 9 to 13 segmented rays. A small adipose dorsal fin present. Anal fin with 7 to 11 segmented rays. Pectoral fins long with 15 to 20 rays, extending beyond the dorsal fin. Fins without spines. Caudal fin bilobed. Body with ctenoid or cycloid scales.

Species known to occur in Karnataka

1. *Chlorophthalmus agassizi* Bonnaparte (Shortnose greeneye)
2. *Chlorophthalmus bicornis* Norman (Spinyjaw greeneye)

Key to the species

1a. Lower jaw terminating in a projecting, denticulate bony plate; origin of dorsal fin closer to adipose fin than to tip of snout ... . *C. bicornis*

1b. No projecting denticulate plate on lower jaw; origin of dorsal fin much closer to tip of snout than to adipose fin ..... *C. agassizi*

Fisheries information : The greeneyes fishes are of little commercial importance. These fishes are captured as trash fish along the commercial catches and are found in both the coasts of our country.

Family 36 SYNODONTIDAE (Lizardfishes)

Head usually lizard-like. Body elongate, generally cylindrical with adipose dorsal fin. Mouth terminal, large with rows of small, slender and pointed teeth, visible even when the mouth is closed. Dorsal fin with 9 to 14 rays. Anal fin with 8 to 16 rays. Caudal fin forked. Body and head with scales.

Lizardfishes not only resemble reptiles but also behave like that of reptiles. Most of their time is spent sitting on the bottom with the body at a

slight angle, propped up on the front end by the pelvic fins, like a jet fighter ready to take off. *Harpadon* is secondarily pelagic.

Species known to occur in Karnataka

1. *Harpadon nehereus* (Hamilton) (Bombay duck)
2. *Saurida micropectoralis* Shindo & Yamada (Shortfin lizardfish)
3. *Saurida tumbil* (Bloch) (Greater lizardfish)
4. *Saurida undosquamis* (Richardson) (Brushtooth lizardfish)
5. *Saurida wanieso* Shindo &Yamada (Wanieso lizardfish)
6. *Synodus engelmani* Schultz (Engleman's lizardfish)
7. *Synodus indicus* (Day) (Indian lizardfish)
8. *Synodus variegatus* (Lacepède) (Variegated lizardfish)
9. *Trachinocephalus myops* (Bloch & Schneider) (Bluuntnose lizardfish)

Key to species

1a. Head and anterior part of body naked, except for scales on lateral line; caudal fin trilobed; pectoral fin tip extends to below middle of dorsal fin base ..... *H. nehereus*

1b. Head and body scaled; caudal fin forked; pectoral fin short, reaching at most just beyond origin of dorsal fin 2

2a. A single band of teeth on each palate (inner band absent); pelvic fin consists of 8 rays, inner ray distinctly longer than outer ray 3

2b. Two bands of teeth on each palate; pelvic fin consists of 9 rays, inner ray not or slightly longer than outer ray 5

3a. Dorsal fin base shorter than anal fin base; snout short, shorter than eye diameter .... *T. myops*

3b. Dorsal fin base longer than anal fin base; snout longer, greater than eye diameter 4

4a. Dermal flap on anterior nostril short, tubular; posterior part of cheek scaly; peritoneal spots 7 to 10 ..... *S. englemani*

4b. Dermal flap on anterior nostril long flagellum, extending well beyond edge of nares; posterior part of cheek naked; peritoneal spots 10 to 12 ..... *S. variegatus*

5a. Pectoral fin tip not reaching to pelvic fin origin; spots on flanks and on second ray of dorsal fin present ..... *S. micropectoralis*

5b. Pectoral fin tip reaching well beyond pelvic fin origin 6

6a. Second dorsal fin ray (sometimes also 3rd and 4th) distinctly elongated in adults; two rows of teeth on anterior part of outer palatine tooth band ..... *S. wanieso*

6b. Dorsal fin without elongate rays 7

7a. A series of fairly distinct distinct 8 to 10 dark blotches along lateral line; vomerine teeth absent; anterior outer palatine with 2 rows of teeth ..... *S. undosquamis*

7b. No spots along the lateral line; vomerine teeth present; anterior outer palatine with 3 or more rows of teeth ..... *S. tumbil*

Fisheries information : The Bombay duck form an important fishery of commercial value, particularly in the Maharashtra and Gujarat coasts. These fishes occur in both the coasts of India but almost 98% of its catch is obtained from the west coast. The remaining 2% of the Bombay duck is captured along the east coast of India. It is marketed fresh, salted dried or smoked. Lizard fishes are of not much commercial value. These fishes are marketed fresh or used for fishmeal.

Order XVI MYCTOPHIFORMES

Head and body compressed. Eyes lateral. Mouth large and terminal. Pelvic fin usually with 8 rays. Branchiostegal rays 7 to 11. Adipose dorsal

fin present. Upper pharyngobranchial not extended. Photophores on body present.

Family 37 MYCTOPHIDAE
(Lanternfishes)

Head and trunk compressed. Eyes large. Mouth usually terminal; jaws extending to or far beyond vertical through posterior margin of eye. Branchiostegal rays 7 to 11. Well developed gill rakers usually present. No spine in all fins; adipose fin present; origin of anal fin under or close behind base of dorsal fin. Discrete, round or kidney-shaped photophores in distinct groups on head and body. Additional light organs of various shapes and sizes present on head, caudal peduncle, or on both. Scales usually cycloid.

Species known to occur in Karnataka

1. *Diaphus dumerilii* (Bleeker) (Dumeril's lanternfish)

Fisheries information : Myctophids play an important role in marine food chain, but not considered as a food fish for human consumption due to its small size.

Order XVII GADIFORMES

Body usually elongate. Pelvic fins thoracic or jugular, inserted below or in front of pectoral fin. Branchiostegal rays 6 to 8. True spines on fins absent. Dorsal and anal fins mostly long based. Scales usually cycloid.

Key to families

1a. First dorsal fin on nape as an elongated ray only and the second with a deep notch in the middle; caudal fin distinct..... ..... BREGMACEROTIDAE

1b. First dorsal fin normal, second dorsal and anal fin confluent with caudal fin, which tapers to a sharp point ..... MACROURIDAE

Family 38 BREGMACEROTIDAE
(Codlets, Codlings)

Body elongate, almost cylindrical. Snout short. Head small and more or less compressed. Dorsal fins two, the first dorsal inserted on nape with one elongated ray. Second dorsal fin and anal fins very long with large notch in middle. Pelvic fins inserted to throat with 5 rays, outer 3 rays elongate free filaments, extending backward up to one half length of the fish. Lateral line near to second dorsal fin.

Species known to occur in Karnataka

1. *Bregmaceros mcclellandi* Thompson (Spotted codlet)

Fisheries information : The Indian cod is generally found in the west coast. It forms a seasonal fishery around Bombay coast. It is marketed fresh.

Remarks : This species have been reported as *Bregmaceros atripinnis* Day, a junior synonym (Cohen *et al*, 1990).

Family 39 MACROURIDAE
(Grenadiers or Rattails)

Head large, trunk short; tail long, tapering to a point. Snout often protruding. Eyes usually large. Caudal fin absent. Two dorsal fins; first dorsal fin short and high, first 2 rays spinous, but true spines absent. Second dorsal fin and anal fin long and continuous with tail. Pelvic fins thoracic to almost jugular, placed before pectoral fin base. Scales small, with spinules in most species.

Species known to occur in Karnataka

1. *Malacocephalus laevis* (Lowe) (Spothead grenadier)

Fisheries information : This is a deep-sea fish, almost benthopelagic in habit. Commercial value of this species is very limited at present. This is mostly caught incidentally by the trawlers fishing in deep waters and used in fishmeal preparation.

Order XVIII OPHIDIIFORMES

Pelvic fins, when present, mental or jugular in position, inserted at level of preopercle or before and with one or two soft rays. Dorsal and anal fin

with long base, often confluent with caudal fin. Nostrils paired on each side.

Family 40 OPHIDIIDAE
(Cusk eels, Brotulas)

Body elongate with a tapering caudal portion. Barbels present on snout and chin in some species. Dorsal fin rays generally equal to or longer than opposing anal fin rays. Pelvic fins with one or 2 soft rays or absent, inserted close together below preopercle or further anterior. Dorsal and anal fins with long bases, confluent with caudal fin. Fins without spines.

Species known to occur in Karnataka

1. *Brotula multibarbata* Temminck & Schlegel (Goatbeared brotula)

Fisheries information : The cusk eels are of minor commercial value and are marketed fresh. *B. multibarbata* is occasionally found in the commercial catches.

Order XIX BATRACHOIDIFORMES

Body usually scaleless. Head large with eyes more or less dorsally placed. Mouth large, often with some barbels or flaps under chin. Gill opening at base of pectoral fin, gill membrane broadly joined to isthmus. Gill cover with 3 or 4 spines. Axil of pectoral fin often with a pore. Pelvic fins jugular, with 2 or 3 soft rays. First dorsal fin with 3 strong spines; second dorsal fin long based. Usually with one or three lateral lines. Branchiostegal rays six.

Family 41 BATRACHOIDIDAE
(Toadfishes)

Body cylindrical, compressed posteriorly. Head and anterior part of body depressed. Mouth moderate, small conical teeth in both jaws and on palate. Gill opening, a relatively large oblique slit above pectoral fin base. Operculum with 3 or 4 strong spines. Dorsal fin two, first dorsal fin with 3 spines, inserted just behind head. Second dorsal fin and anal fin with long bases. Pelvic fins jugular. Pectoral and caudal fins rounded. A moderate sized pocket may present in upper part of pectoral fin axil. Three lateral lines along sides represented by a series of small bifid tentacles.

Species known to occur in Karnataka

1. *Allenbatrachus grunniens* (Linnaeus) (Gangetic toadfish)
2. *Colletteichthys dussumieri* (Valenciennes) (Flat toadfish)

Key to species

1a. A pocket-like foramen present on upper portion of pectoral axilla; gill opening wide, continued to below and anterior to pectoral fin base ..... *C. dussmieri*

1b. No pocket-like foramen on upper part of pectoral axilla; gill opening restricted, confined to pectoral fin base .... *A. grunniens*

Fisheries information : The toadfishes are of no commercial value. These fishes are captured along with commercial catches in the trawl fisheries. The toadfishes are utilized in fishmeal preparation.

Order XX LOPHIIFORMES

Head depressed. First ray of spinous dorsal fin placed on head and modified into illicium and esca. Pelvic fins, when present, placed before pectorals. Gill opening small, tubelike, at or behind pectoral fin base. First vertebra fused to skull.

Family 42 LOPHIIDAE
(Goosefishes, Anglerfishes)

Anterior part of body much depressed and very broad, posterior part tapering. Head rounded, with numerous sharp spines and ridges on dorsal and lateral surfaces. Mouth very large and wide, upper jaw protractile and lower jaw projecting; both having numerous long, sharp depressible teeth. Two dorsal fins, the first with 2 or 3 isolated slender spines on head (Cephalic spines) and second with 1 to 3 spines (often connected by a

membrane, at least in juveniles) at the level of pectoral fins (post cephalic spines). Pectoral fin rays unbranched, terminating in small fleshy filaments. Anal fin with 6 to 11 rays, inserted below second dorsal fin. Caudal fin with 8 rays, outer 2 rays unbranched.

Species known to occur in Karnataka

1. *Lophiodes mutilus* (Alcock) (Smooth angler)
2. *Lophiomus setigerus* (Vahl) (Blackmouth angler)

Key to the species

1a. Pectoral fin with 21 to 25 rays; frontal ridge rugoge, bearing spines, knobs and ridges; gill slits not extending in front of pectoral fin base ..... *L. setigerus*

1b. Pectoral fin with 15 to 18 rays; frontal ridge smooth, no spine, knob or ridges present; gill slits extending well in front of pectoral fin base ..... *L. mutilus*

Fisheries information : The Anglerfishes or Goosefishes are of no commercial value. These fishes are found in the bottom trawls as bycatch in the commercial catches.

Order XXI MUGILIFORMES

Body fusiform, covered with large scales. Mouth moderate in size; teeth small or absent. Two dorsal fins widely separate, the first one typicaly with four spines. Pectoral fins high on body. No direct articulation between the pelvic girdle and the cleithra. Body covered with large scales; lateral line absent.

Family 43 MUGILIDAE
(Mullets)

Body elongate, cylindrical or slightly compressed. Mouth small, terminal or inferior. Eyes usually covered by fatty tissue (adipose eyelids). Dorsal fin two, well separated, the first with 4 spines and the second with one spine and 8 or 9 soft rays. Anal fin with 3 spines. Pectoral fins set rather high on body. Pelvic fins subadominal, with one spine and 5 branched rays. Caudal fin moderately forked, ermarginate or truncate. Lateral line absent.

Species known to occur in Karnataka

1. *Liza macrolepis* (Smith) (Largescale mullet)
2. *Liza melinoptera* (Valenciennes) (Otomebora mullet)
3. *Liza parsia* (Hamilton) (Gold-spot mullet)
4. *Liza subviridis* (Valenciennes) (Greenback mullet)
5. *Liza planiceps* (Valenciennes) (Tade mullet)
6. *Liza vaigiensis* (Quoy & Gaimard) (Squaretail mullet)
7. *Mugil cephalus* Linnaeus (Flahead mullet)
8. *Valamugil cunnesius* (Valenciennes) (Longaram mullet)
9. *Valamugil seheli* (Forsskal) (Bluespot mullet)
10. *Valamugil speigleri* (Bleeker) (Speigler's mullet)

Key to the species

1a. Posterior tip of maxilla (upper jaw) not curved below tip of premaxilla; adipose eyelids well developed; anal fin with 8 soft rays .... *M. cephalus*

1b. Posterior tip of maxilla (upper jaw) curved below tip of premaxilla; adipose eyelids well developed, feeble or absent; anal fin with 9 soft rays (rarely 8) 2

2a. Pectoral axillary scale pointed and long; scales with membranous digitated hind margin ... 3

2b. Pectoral axillary scale small or absent; hind margin of scales not digitated 7

3a. Adipose tissue covers half to most of eye; second dorsal fin origin on vertical through anal fin origin; maxilla not reaching anterior margin of eye ..... *V. seheli*

3b. Adipose tissue around eye feeble or absent; second dorsal fin origin on vertical behind

anterior fourth of anal fin base; maxilla reaching anterior margin of eye 4

4a. Scales in lateral series 30 to 35; soft dorsal and anal fins moderately scaled; pectoral fin extending to vertical between 3rd and 4th spine of first dorsal fin ..... *V. cunnesius*

4b. Scales in lateral series 37 to 40; soft dorsal and anal fins densely scaled; pectoral fin extending to vertical from 2nd spine of first dorsal fin ..... *V. speigleri*

5a. Anal fin rays 8; caudal fin almost truncate ..... *L. vaigiensis*

5b. Anal fin rays 9; caudal fin forked.....6

6a. Transverse rows of scales 12..... ..... *L. macrolepis*

6b. Transverse rows of scales less than 12.....7

7a. Second dorsal fin origin over posterior half of anal fin base ..... *L. planiceps*

7b. Second dorsal fin origin over anterior half of anal fin base.....8

8a. Preorbital bone narrow, not filling space between mouth and eye; corner of mouth on vertical through anterior nostril .... *L. subviridis*

8b. Preorbital bone wide, filling space between mouth and eye; corner of mouth on vertical behind anterior nostril 9

9a. First dorsal fin origin nearer to snout tip than to caudal fin base; transverse rows of scales 11 .....*L. parsia*

9b. First dorsal fin origin nearer to caudal fin base than to snout tip; transverse rows of scales 9 to 10.....*L. melinoptera*

Fisheries information : Mullets are very important commercial fishes. Most of the species are suitable for aquaculture due to their rapid growth and hardiness.

Remarks : This family was under order Perciformes in literatures, but following Jayaram (1999) and Nelson (2006) it is being kept separated. Records of *Mugil jerdoni* Day and *Liza dussumieri* (Valenciennes) are referable to *Liza subviridis* (Valenciennes). Records of *Liza tade* (Forsskal) are to be treated as *Liza planiceps* (Valenciennes).

Order XXII BELONIFORMES

Upper jaw fixed or nonprotrusible. Interacrural cartilage small or absent. Lower caudal fin lobe with more principal rays than the upper lobe. Single dorsal fin placed in posterior half on body. Pectoral fin high on body.

Key to families

1a. Both upper and lower jaw extended into long beak with numerous needle-like teeth; mouth large ..... BELONIDAE

1b. Only lower jaw prolonged or none of jaws prolonged, with minute teeth or without teeth; mouth small.....2

2a. Lower jaw usually prolonged, much longer than upper; pectoral and pelvic fins short .. ..HEMIRAMPHIDAE

2b. Both jaws short and normal and not prolonged into a long beak; pectoral fins strikingly long, extending beyond origin of dorsal fin; pelvic fins exceptionally large in some species..... ..... EXOCOETIDAE

Family 44 EXOCOETIDAE
(Flying fishes)

Body elongate and cylindrical, flattened ventrally. Fins without spines. Dorsal and anal fins inserted far back on body. Pectoral fins considerably long, inserted high on sides, extending beyond dorsal fin origin. Pelvic fins inserted abdominal in position and greatly enlarged in many species. Caudal fin deeply forked, lower lobe longer than upper. Lateral line low on body.

Species known to occur in Karnataka

1. *Cheilopogon cyanopterus* (Valenciennes) (Margined flyingfish)
2. *Cheilopogon furcatus* (Mitchill) (Spotfin flyingfish)

3. *Cheilopogon nigricans* (Bennett) (African flyingfish)
4. *Cheilopogon suttoni* (Whitley & Colefax) (Sutton's flyingfish)
5. *Cypselurus naresii* (Gunther) (Pharao flyingfish)
6. *Cypselurus poecilopterus* (Valenciennes) (Yellow-wing flyingfish)
7. *Exocoetus monocirrhus* Richardson (Barbel flyingfish)
8. *Exocoetus volitans* Linnaeus (Tropical two-wing flyingfish)
9. *Hirundichthys coromandelensis* (Hornell) (Coromandel flyingfish)
10. *Parexocoetus brachypterus* (Richardson) (Sailfin flyingfish)
11. *Parexocoetus mento* (Valenciennes) (African sailfin flyingfish)
12. *Prognichthys brevipinnis* (Valenciennes) (Shortfin flyingfish)

Key to the species

1a. Pelvic fins short, not extending to or just reaching to anal fin origin 2

1a. Pelvic fins long, extending beyond anal fin origin 5

2a. Pectoral fins extending beyond anal fin base; pelvic fins short, far from reaching anal fin origin; pelvic fin origin nearer to pectoral fin base than to anal fin origin; lateral line without a branch to pectoral fin origin; upper jaw not protrusible 3

2a. Pectoral fins not extending beyond anal fin base; pelvic fins medium, hardly reaching anal fin origin; pelvic fin origin nearer to anal fin origin than to pectoral fin base; lateral line with a branch extending upward to pectoral fin base; upper jaw protrusible 4

3a. Body depth 3.5 to 5.1 in standard length; gill rakers 21 to 29 on first arch; usually 7 rows of scales between dorsal fin origin and lateral line ..... *E. monocirrhus*

3b. Body depth 5.1 to 6.0 in standard length; gill rakers 29 to 37 on first arch; usually 6 rows of scales between dorsal fin origin and lateral line ..... *E. volitans*

4a. Predorsal scales 20 to 24; dorsal fin rays 12 to 14, depressed dorsal fin reaching beyond origin of upper caudal fin lobe; anal fin rays 12 to 14; body depth 5.0 to 6.5 and head length 4.1 to 4.5 in standard length .... *P. brachypterus*

4b. Predorsal scales 16 to 20; dorsal fin rays 9 to 12, depressed dorsal fin hardly reaching origin of upper caudal fin lobe; anal fin rays 10 to 12; body depth 4.5 to 5.0 and head length 3.7 to 4.0 in standard length ..... *P. mento*

5a. First 2 to 4 rays in pectoral fin unbranched ..... *P. brevipinnis*

5b. Only the first pectoral fin ray unbranched 6

6a. Anal fin origin anterior to third ray of dorsal fin; dorsal fin usualy with less or equal number of rays than anal fin (rarely with 1 or 2 more) ..... *H. coromondelensis*

6b. Anal fin origin under or behind third ray of dorsal fin; dorsal fin usualy with 2 to 4 rays (rarely 1) more than the rays in anal fin 7

7a. Lower jaw usually a little shorter than upper and included beneath the upper jaw, at least some jaw teeth tricuspid; juveniles with a sinlge chin barbel or without barbel 8

7b. Lower jaw subequal or lower jaw a little longer than upper jaw, jaw teeth mostly unicuspid or with supplementary cusps laterally; juveniles with two barbels (or fused) 9

8a. Pectoral fins usually dark, without dark spots; pelvic fin origin midway between head and caudal fin base; predorsal scaleas 27 to 32 ..... *C. naresii*

8b. Pectoral fins pale, with numerous dark spots arranged in bands; pelvic fin origin nearer to head than to caudal fin base; predorsal scales 24 to 28 ..... *C. poecilopterus*

9a. Predorsal scales 34 to 41 10

9b. Predorsal scales 24 to 33 11

10a. Pectoral fin with small dark spots scattered on pale background; pelvic fin origin midway between head and caudal fin base .... *C. suttoni*

10b. Pectoral fin without spots, uniformly dark; pelvic fin origin nearer to hind margin of head than to caudal fin base .... *C. cyanopterus*

11a. Dorsal fin with a prominent black spot; palatine teeth present; jaw teeth clearly noticeable; pectoral fin black with a narrow pale margin and a yellowish central stripe ..... *C. nigricans*

11b. Dorsal fin uniformly pale; palatine teeth absent; jaw teeth barely visible; pectoral fin grayish with a pale triangular cross band and a wide pale margin ..... *C. furcatus*

Fisheries information : Taken commercially only occasionally, but of minor fishery importance. Flying fishes are usually considered as good food fish.

Remarks : Reports of *Cypselurus comatus* (Mitchill) from Indian waters are referable to *Cypselurus naresii* (Gunther) (Barman and Mishra, 2006).

Family 45 HEMIRAMPHIDAE
(Halfbeaks)

Body greatly elongate. Lower jaw prolonged and a short triangular upper jaw. Fins without spines. Dorsal and anal fins inserted in posterior half of body. Pelvic fins with 6 soft rays, abdominal in position. Pectoral fins generally short. Lateral line originates from pectoral fin origin and then bends downward extending backward along the ventral border of body. Body with cycloid scales.

Species known to occur in Karnataka

1. *Hemiramphus archipelagicus* Collete & Parin (Jumping halfbeak)
2. *Hemiramphus far* (Forsskal) (Black-barred halfbeak)
3. *Hyporhamphus dussumieri* (Valenciennes) (Dussumieri's half beak)
4. *Hyporhamphus limbatus* (Valenciennes) (Keel-jawed halfbeak)
5. *Hyporhamphus quoyi* (Valenciennes) (Quoy's garfish)
6. *Hyporhamphus xanthopterus* (Valenciennes) (Red-tipped halfbeak)
7. *Rhynchorhamphus georgii* (Valenciennes) (Long-billed halfbeak)
8. *Zenarchopterus dispar* (Valenciennes) (Feathered river garfish)

Key to species

1a. Nasal papilla elongate and pointed, strongly projecting beyond nasal fossa; caudal fin rounded or truncate ..... *Z. dispar*

1b. Nasal papilla rounded, fan shaped or fimbricate, not projecting from margin of nasal fossa; caudal fin emarginate or deeply forked 2

2a. Scales absent on snout; preorbital ridge absent 3

2b. Scales present on snout; preorbital ridge well developed 4

3a. Dorsal fin with well developed anterior lobe; pigmented in anterior part; body width 1.3 to1.8 times its depth; 3 to 9 dark spot on side of body ..... *H. far*

3b. Dorsal fin without well developed anterior lobe; pigmented along margin; body width 1.8 to 2.0 times its depth; no dark spot on side of body ..... *H. archipelagicus*

4a. Nasal papillae fimbriate; upper jaw arched; gill rakers on first arch 47 to 78; lateral line

with 2 branches ascending behind opercle and pectoral fin origin ..... *R. georgii*

4b. Nasal papillae not fimbriate; upper jaw flat or almost flat; gill rakers on first arch 19 to 47; lateral line with one branch ascending behind opercle and pectoral fin origin 5

5a. Preorbital canal simple, without posterior branch; caudal fin weakly or moderately forked 6

5b. Preorbital canal T-shaped, with posterior branch; caudal fin strongly forked, usually with elongate lower lobe 7

6a. Total gillrakers 46 to 53 on first arch, 40 to 47 on second arch ..... *H. xanthopterus*

6b. Total gillrakers 19 to 37 on first arch, 16 to 28 on second arch ..... *H. limbatus*

7a. Upper jaw projection pointed; gill rakers on first arch 36 to 47; lower jaw moderately short, in adult fish its length up to 1.4 times in head length .....*H. dussumieri*

7b. Upper jaw projection blunt and rounded; gill rakers on first arch 26 to 34; lower jaw shorter, in adult fish its length up to 2 times in head length ..... *H. quoyi*

Fisheries information : The halfbeaks are of important commercial value and are utilized fresh, dried salted and smoked.

Remarks : Reports of *Hyporhamphus gaimardi* (Valenciennes) is referable to *H. quoyi* (Valenciennes).

Family 46 BELONIDAE
(Needlefishes)

Body considerably elongate with both upper and lower jaw extended into long beaks. Fins without spines. Dorsal and anal fins inserted in posterior half of body. Pelvic fins inserted in abdominal position and with 6 soft rays. Pectoral fins short. Lateral line extending down from pectoral fins origin and then pass along ventral margin of sides.

Species known to occur in Karnataka

1. *Ablennes hians* (Valenciennes) (Flat needlefish)
2. *Tylosurus crocodilus crocodilus* (LeSueur) (Hound needlefish)
3. *Strongylura strongylura* (van Hasselt) (Spottail needlefish)
4. *Strongylura leiura* (Bleeker) (Banded needlefish)
5. *Tylosurus acus melanotus* (Bleeker) (Keel-jawed needlefish)

Key to the species

1a. Body strongly laterally compressed and marked with a series of vertical bars; anal fin with 24 to 28 rays ..... *A. hians*

1b. Body rounded or squarish in cross-section; body without vertical bars; anal fin with 13 to 23 rays 2

2a. Dorsal fin rays 12 to 21; caudal peduncle without keel 3

2b. Dorsal fin rays 20 to 27; a dark lateral keel on each side of caudal peduncle 4

3a. Caudal fin rounded or truncate with a prominent black spot near its base; dorsal fin with 12 to 15 rays and anal fin with 15 to 18 rays ..... *S. strongylura*

3b. Caudal fin emarginate without black spot; dorsal fin with 17 to 21 rays and anal fin with 23 to 25 rays ..... *S. leiura*

4a. Dorsal fin rays 24 to 27 and anal fin rays 22 to 24; upper jaw strongly curved upward at its origin forming a gap between the jaws . .....*T. acus melanotus*

4b. Dorsal fin rays 20 to 24 and anal fin rays 19 to 22; upper jaw straight, with no gap between the jaws .....*T. crocodilus*

Fisheries information : The needle fishes are of commercial importance. These fishes are mostly utilized fresh and are very tasty for their excellent flavour.

Order XXIII ATHERINIFORMES

Mouth small, upper jaw protrusible. Margins of opercle and preopercle without spines or serrations. Orbitosphenoid absent. Two widely separated dorsal fins; spines flexible. Anal fin with a single spine. Lateral line absent or weak.

Family 47 ATHERINIDAE
(Silversides)

Body elongate, almost compressed and silvery. Mouth usually small, terminal or oblique. Dorsal fins two, well separated, first dorsal fin with a variable number of small, flexible spines. Second dorsal fin and anal fins each with one weak spine, one unbranched ray and a variable number of branched rays. Pectoral fins inserted high on body. Pelvic fins with one spine and 5 rays. Caudal fin almost forked. Lateral line absent. A midlateral band generally present, extending from upper angle of pectoral fins to caudal fin base,

Species known to occur in Karnataka

1. *Atherinomorus duodecimalis* (Valenciennes) (Tropical silverside)
2. *Atherinomorus lacunosus* (Forster) (Hardyhead silverside)
3. *Hypoatherina temminkii* (Bleeker) (Samoan silverside)

Key to species

1a. Ascending premaxillary process moderately long and narrow, its length $^1/_3$ to ½ of eye diameter; lateral process of premaxilla broad and short; dentary bone sloping strongly upward and backward, with posterior ramus high; gill rakers usually less than diameter of pupil; anus always behind pelvic fin tip..... *H. temminckii*

1b. Ascending premaxillary process short and broad, its length ¼ of eye diameter; lateral process of premaxilla broad and flat; dentary bone sloping gently upward and backward, with or without a slight tubercle-like elevation at distal end; gill rakers equal to or longer tham diameter of pupil; anus at or slightly in front of pelvic fin tip 2

2a. Midlateral scale count 33 to 38; vertical scale count 35 to 37; distal end of upper jaw extending backward slightly beyond vertical through anterior border of orbit..... ..... *A. duodecimalis*

2b. Midlateral scale count 39 to 44; vertical scale count 38 to 43; distal end of upper jaw extending backward to vertical through anterior border pupil .....*A. lacunosus*

Fisheries information : The silverside fishes are usually used as bait and are of important fishes as forage for commercial fishes.

Order XXIV BERYCIFORMES

Body compressed, mostly oblong. Two supramaxilla and orbitosphenoid present. Anterior part of supraorbital and infraorbital sensory canals modified. Fin spines well developed. Pelvic fins usually with more than 5 soft rays. Caudal fin with 16 or 17 branched rays.

Key to families

1a. Dorsal fin with 10 to 13 strong spines; anal fin soft rays 8 to 16 .... HOLOCENTRIDAE

1b. Dorsal fin with 3 to 8 weak spines; anal fin soft rays 25 to 30 ..... BERYCIDAE

Family 48 HOLOCENTRIDAE
(Squirrelfishes, Soldierfishes)

Body oblong and compressed. Margins of membrane bones of head serrated or with spines. Mouth terminal or lower jaw projecting. Dorsal fin with 11 or 12 stout spines and 12 to 17 rays, deeply (sometimes completely) notched between spinous and soft rays. The base of spinous part 2 to 3.5 times longer than soft part. Anal fin with 4 spines, the third spine, the stoutest and usually the longest. Pelvic fins with one spine and 7 soft rays. Caudal fin forked, with 17 branched rays. Body with ctenoid scales and complete lateral line.

Species known to occur in Karnataka

1. *Sargocentron rubrum* (Forsskal) (Redcoat)

Fisheries information : These are small fishes to be of any commercial value, but usually marketed fresh in local markets.

Family 49 BERYCIDAE
(Alfonsinos)

Body oval and laterally compressed. Villiform teeth in bands on jaws, vomer and palatine. Preopercle serrate, but devoid of large spine. Cheek and operculum scally. Dorsal fin without notch, with 4 to 7 spines, increasing in length posteriorly and with 12 to 20 soft rays. Anal fin with 4 spines and 25 to 30 soft rays. Pelvic fin with one spine and 7 to 13 soft rays. Scales ctenoid. Lateral line with 66 to 82 scales, that continues to end of caudal fin.

Species known to occur in Karnataka

1. *Beryx decadactylus* Cuvier (Alfonsino)
2. *Beryx splendens* Lowe (Splendid alfonsino)

Key to the species

1a. Body slender, its depth 2.4 to 2.8 times in standard length; total gill rakers 25 to 28 on first arch; dorsal fin with 13 to 15 soft rays; pored lateral line scales 74 to 80 .... *B. splendens*

1b. Body deeper, its depth 1.9 to 2.3 times in standard length; total gill rakers 23 or 24 on first arch; dorsal fin with 16 to 20 soft rays; pored lateral line scales 63 to 71 .... *B. decadactylus*

Fisheries information : These are good food fishes, occasionally consumed fresh, but often reduced to fishmeal and oil. They are frequently taken in small quantities with bottom trawls and longlines.

Order XXV ZEIFORMES

Body oblong to disc-like, compressed, thin and deep. Jaws greatly distensible. Orbitosphenoid and supramaxilla absent; posttemporal fused to skull. Fin spines well developed. Dorsal, anal and pectoral fin rays undivided. Caudal fin with 11 branched rays. Dorsal fin with 5 to 10 spines and 22 to 36 soft rays.

Key to families

1a. Pelvic fins with 9 or 10 soft rays and no spine; anal fin with 1 or 2 short spines and 29 or 30 soft rays; no bony plates or spines along bases of dorsal and anal fins .... PRAZENIDAE

1b. Pelvic fins with 1 slender, flexible spine and 5 to 7 soft rays; anal fin with 3 or 4 spines and 20 to 26 soft rays; a row of bony plates or spines along base of dorsal and anal fins ..... ZEIDAE

Family 50 PARAZENIDAE
(Smooth dories)

Body elongate and laterally compressed. Dorsal fin with 6 to 7 spines (rarely 8). Pectoral fin with 13 to 15 rays. Pectoral fin with 13 to 15 rays. Pelvic fin with no spine and 9 soft rays, inserted under or slightly ahead of pectoral fin base. (Characters included here for the genus *Cyttopsis* only)

Species known to occur in Karnataka

1. *Cyttopsis rosea* (Lowe) (Rosa dory)

Fisheries information : It is of no commercial value.

Family 51 ZEIDAE
(Dories)

Body oval, compressed; its depth greater than head length. Mouth large, oblique; upper jaw very protrusible. Narrow bands of small teeth on jaws and vomer. Opercular bone devoid of spines and serrae. Dorsal fin with 7 to 11 spines and 22 to 30 rays. Anal fin with 1 to 4 spines and 20 to 30 rays. Dorsal and anal fin rays unbranched. Pelvic fin with 6 to 10 elements, with or without spine. Scales small, rudimentary or absent. Bony scutes along midventral line of abdomen.

Species known to occur in Karnataka

1. *Zenopsis conchifer* (Lowe) (Silvery John dory)

Fisheries information : The dories are not of commercial importance. These fishes are taken by trawls over 100 to 300 meters depth. These are sold fresh and their flesh is excellent to eat.

Order XXVI SYNGNATHIFORMES

Mouth small, placed at the end of a tube shaped snout. Upper jaw not protrusible. Lacrymal bone present, but other circumorbital bones absent. Anterior 3 to 6 vertebrae elongate.

Key to families

1a. Body compressed, deep; scales with sharp ridges and spines; first dorsal fin with 5 to 8 strong spines, second spine enlarged..... ..... MACRORHAMPHOSIDAE

1b. Body elongate, slender; scales not as above; dorsal fin spines usually absent, if present, 8 to 12 isolated, subequal, weak spines 2

2a. Pelvic fins absent; body encased in a series of bony rings; gill opening restricted to a small pore on dorsolateral part of head .... SYNGNATHIDAE

2b. Pelvic fins present; body not armoured, naked; gill opening not restricted 3

3a. Body compressed, with small scales; dorsal fin with 8 to 12 isolated weak spines; caudal fin rounded; chin with a fleshy barbel..... .....AULOSTOMIIDAE

3b. Body depressed, naked; dorsal fin without spines, a row of bony plates before dorsal fin; caudal fin forked; chin barbel absent... .....FISTULARIIDAE

Family 52 FISTULARIIDAE
(Flutemouths, Cornetfishes)

Body greatly elongate, fleshy and slightly depressed. Mouth small, at the tip of a long tubular snout. Dorsal and anal fins opposite, short based with no spines and 14 to 17 soft rays. Pectoral fins with 13 to 17 rays. Pelvic fins with 6 rays, inserted in the abdominal position. Caudal fin with a long filamentous structure, extending from the middle of the lobes.

Species known to occur in Karnataka

1. *Fistularia petimba* Lacepede (Red cornetfish)

Fisheries information : It is of no commercial value, but often used as bait and reduced to fishmeal and sometimes also marketed fresh.

Remarks : This fish have been also reported as *Fistularia villosa* Klunzinger.

Family 53 AULOSTOMIIDAE
(Trumpetfishes)

Body very elongate and laterally compressed. Lower jaw with fleshy barbel at its tip. A series of 8 to 12 isolated spines anterior to dorsal fin of 22 to 27 soft rays. Anal fin with 23 to 28 rays. Caudal fin rounded. Vent situated considerably posterior to pelvic fins. Lateral line well developed and body covered with ctenoid scales.

Species known to occur in Karnataka

1. *Aulostomus chinensis* (Linnaeus) (Chinese trumpetfish)

Fisheries information : This is of no commercial value.

Remarks : Trumpetfishes are predators and generally found near reef areas. They are usually found to swim alongside of larger fish or lie with their bodies at odd angles such as vertical with the head downward until they come closer enough to rush and capture the prey (Nelson, 2006).

Family 54 MACRORHAMPHOSIDAE
(Spinefishes)

Body oval, compressed, deep and generally with bony plates on each side of back. Snout produced into a long tube. Dorsal fin two, first with 4 to 8 spines, second spine greatly enlarged, all joined by a membrane and second with about

11 to 19 soft rays. Bony plates present on sides above pectoral fins and/or ventral midline of body.

Species known to occur in Karnataka

1. *Macrorhamphosus gracilis* (Lowe) (Slender spinefish)

Fisheries information : It is of no commercial value and not known to be marketed.

Remarks : This species has been reported as *Macroramphosus gracilis* (Lowe) from south western coast of India (Silas, 1969). Following Headrich (1984) and Heemstra (1986) this has been considered as a junior synonym of *Macrorhamphosus scolopax* (Linnaeus). But Paxton *et al* (1989) recognized *M. gracilis* as a distinct species which was established by Assis (1992, 1993).

Family 55 SYNGNATHIDAE
(Sea horses, Pipefishes)

Body elongate, angular or laterally compressed or rounded. Head slender, generally with a produced tube-like snout. Mouth terminal and oblique. Dorsal fin with soft rays only. Pelvic fins absent. Caudal fin sometimes absent. Tail long, prehensile in Sea horses. Body completely armoured by bony scutes, arranged regularly in series and forming rings round the body.

Species known to occur in Karnataka

1. *Hippocampus kuda* (Bleeker) (Spotted seahorse)

Fisheries information : Spotted seahorse is a highly commercial fish and widely used in aquarium trade. It is also highly valued fish in Chinese medicine.

Order XXVII SCORPAENIFORMES

Body shape variable. A bony ridge known as suborbital stay across the cheek present. It is the posterior extension of the third infraorbital bone that extends to preoperculum and firmly attached to preopercle bone. Head usually spiny, sometimes covered with bony plates. Body mostly covered with scales, but some are naked. Pectoral and caudal fins usually rounded.

Key to families

1a. Head encased by expanded bones that firmly attached to each other 2

1b. Head not encased with bony armour 3

2a. Preopercular spine long; dorsal fin with one or two isolated spines on nape .... DACTYLOPTERIDAE

2b. Preopercular spine short; no isolated dorsal fin spine on nape ..... TRIGLIDAE

3a. Two dorsal fins; head strongly flattened; anal fin without spine ..... PLATYCEPHALIDAE

3b. One dorsal fin; head not strongly flattened; anal fin with 2 or 3 spines 4

4a. Body naked ..... SYNANCEIIDAE

4b. Body covered with scales 5

5a. Lowermost pectoral fin ray free from the rest ..... APISTIDAE

5b. Lowermost pectoral fin ray not free 6

6a. Dorsal fin begins before or above eye .... TETRAROGIDAE

6b. Dorsal fin begins behind eye 7

7a. Lateral line a continuous trough covered by thin scales above it; no tubed lateral line scales ..... SETARCHIDAE

7b. Lateral line consists of tubed scales, no thin scales ..... SCORPAENIDAE

Family 56 DACTYLOPTERIDAE
(Flying gurnard)

Body more or less elongate with heavily armoured large and blunt head. Eyes large with a small movable bone between plate-like bones around eye and preopercle. Preopercle with a prominent spine. Spinous and soft dorsal fins separated by a deep notch with 6 to 7 spines, of which the first or first two anterior ones are separated from the rest of the fin; soft dorsal fin

with 8 rays. Anal fin with 6 or 7 soft rays. Pectoral fins divided into 2 parts, a short anterior part with 5 rays and a long posterior part with 25 to 31 rays, extending to base of caudal fin in adults. Lower side of posterior part of trunk with 2 to 4 enlarged keel-like scales. Scale scute forming prominent keels.

Species known to occur in Karnataka

1. *Dactyloptena macracanthus* (Bleeker) (Spotwing flying gurnard)
2. *Dactyloptena orientalis* (Cuvier) (Orientralis flying gurnard)

Key to the species

1a. Lateral line present and extending to caudal peduncle; an oblong black blotch over middle of pectoral fins ..... *D. macracantha*

1b. Lateral line absent; no black blotch over middle of pectoral fins ..... *D. orientalis*

Fisheries information : The flying gurnard fishes are of no commercial importance.

Family 57 APISTIDAE
(Wasp scorpionfish)

Body compresed. Head usually with ridges and spines. Dorsal fin with 14 to 16 spines and 8 to 10 soft rays. Anal fin with 3 to 4 spines and 6 to 8 soft rays. Pectoral fin with 11 to 13 rays, the lowermost ray free. Chin with 3 pairs of barbels. Branchiostegal membrane not fused to isthmus. Caudal fin rounded to square-cut but never forked.

Species known to occur in Karnataka

1. *Apistus carinatus* (Bloch & Schneider) (Ocellated wasp scorpionfish)

Fisheries information : Waspfishes are of no fishery importance. It is a venomous fish.

Family 58 SCORPAENIDAE
(Scorpionfishes)

Body almost compressed to robust, usually bass-like with large spiny head. A bony ridge below eye (suborbital stay) extending posteriorly and firmly attaching to preopercle. Preopercular border with 3 to 5 spines, the uppermost 3 well developed. Opercle with 2 divergent spines or a single spine, the other spines scattered on head. A single dorsal fin, usually notched posterior to the spinous part, with 8 to 18 spines and 4 to 14 rays. Anal fin with 2 to 4 spines and 5 to 14 rays. Pectoral fins broad based, large, fan-like with 11 to 23 rays. Pelvic fins inserted in thoracic region, with one spine and 3 to 5 branched or simple rays. Caudal fin rounded to square-cut but never forked.

Species known to occur in Karnataka

1. *Pterois russelli* (Bennett) (Plaintail turkeyfish)
2. *Pterois volitans* (Linnaeus) (Red lionfish)

Key to the species

1a. Pectoral fin usually with 14 rays. Interorbital space scaleless. Transverse scale rows above lateral line 12 to 14. Median fins with small dark spots ..... *P. volitans*

1b. Pectoral fin usually with 13 rays. Interorbital space scally. Transverse scale rows above lateral line 9 or 10. Median fins without spots ..... *P. russelii*

Fisheries information : The scorpion fishes are of little commercial importance. A few species are used as aquarium exhibits.

Remarks : The scorpion fishes known to contain venomous spines, and so, they should be very carefully handled.

Family 59 TETRAROGIDAE
(Wasp fishes)

Body covered with small embedded scales. Dorsal fin originates on head, usually 2 or 3 pairs of pharyngeal tooth plates. Pseudobranch well developed with 10 to 15 filaments. These are small to moderate sized benthic fishes, primarily restricted to Indo-West Pacific region and found up to the depth of 300 m.

Species known to occur in Karnataka

1. *Pseudovespicula dracaena* (Cuvier) (Draco waspfish)

Fisheries information : It is of no interest to fisheries and is a venomous fish.

Family 60 SYNANCIIDAE
(Stonefish)

Body compresed. Head usually with ridges and spines. Dorsal fin with 14 to 16 spines and 8 to 10 soft rays. Anal fin with 3 to 4 spines and 6 to 8 soft rays. Pectoral fin with 11 to 13 rays, the lowermost ray free. Chin with 3 pairs of barbels. Branchiostegal membrane not fused to isthmus. Caudal fin rounded to square-cut but never forked. Skin naked, without scale covering.

Species known to occur in Karnataka

1. *Choridactylus multibarbus* Richardson (Orange banded goblinfish)
2. *Minous monodactylus* (Bloch & Schneider) (Grey stingfish)
3. *Synanceia verrucosa* Bloch & Schneider (Stonefish)

Key to the species

1a. Ventralmost pectoral fin ray not detached or separate from remainder of fin .... *S. verrucosa*

1b. Ventralmost pectoral fin ray detached or separate from remainder of fin 2

2a. Pectoral fin with a single free ray ventrally .....*M. monodactylus*

2b. Pectoral fin with 3 free ray ventrally .... *C. multibarbus*

Fisheries information : These fishes are of no commercial value.

Remarks : These are the most venomous of all fishes and need to be handled carefully when found in catches. If stepped on this fish, the needle-sharp dorsal spine penetrates leading to release of venom into the wound which cause intolerable pain.

Family 61 SETARCHIDAE
(Deepsea bristly scorpionfishes)

Body elongate and covered by small, cycloid scales. Lateral line a continuous trough covered by thin membranous scales. Bones weakly ossified. Single dorsal fin, notched before soft part. Dorsal fin insertion above pectoral fin base, with 12 spines and 9 or 10 rays. Anal fin with 3 spines and 5 rays. Pectoral fin with 20 to 25 rays.

Species known to occur in Karnataka

1. *Setarches guentheri* Johnson (Deepwater scorpionfish)

Fisheries information : It is of no fishery interest and is a venomous fish.

Family 62 TRIGLIDAE
(Gurnards or Sea robins)

Body elongate, fusiform, with a row of spines along each side of dorsal fin bases. Scales small, ctenoid and imbricate or rudimentary and more or less embedded. Head large, encased in bony plates. Pectoral fin with lower 3 rays free and enlarged. Dorsal fin divided in to spinous and soft-rayed part. Pelvic fins originate below pectoral fin base. Caudal fin with 11 or 12 principal rays and 9 or 10 branched rays. Maxilla covered by preorbital bone.

Species known to occur in Karnataka

1. *Lepidotrigla faueri* Gilchrist & Thompson (Scalybeast gurnard)
2. *Lepidotrigla omanensis* Regan (Oman gurnard)

Key to the species

1a. Rostral process with several prominent spines ..... *L. faueri*

1b. Rostral process with a single pair of prominent spine ..... *L. omanensis*

Fisheries information : Not of any fishery importance.

Family 63 PLATYCEPHALIDAE
(Spiny flatheads)

Body elongate with almost to strongly depressed head. Bony ridges of head generally with spines or serrations. Mouth large, lower jaw longer than upper. Two dorsal fins, considerably separated; spinous dorsal fin with 8 to 10 spines (usually 9 spines), the first spine short and scarcely connected to the second. Soft dorsal and anal fins with 10 to 15 rays. Pelvic fins thoracic in position and set far apart towards sides of body with 1 spine and 5 soft rays. Lateral line complete, anterior scales of lateral line usually with spines.

Species known to occur in Karnataka

1. *Cociella crocodila* (Tilesius) (Crocodile flathead)
2. *Grammoplites scaber* (Linnaeus) (Rough flathead)
3. *Grammoplites suppositus* (Troschel) (Spotfin roughhead)
4. *Kummococius rodericensis* (Cuvier) (Spiny flathead)
5. *Platycephalus indicus* (Linnaeus) (Bartail flathead)
6. *Rogadius asper* (Cuvier) (Olive-tail flathead)
7. *Rogadius melanopterus* (Knapp & Wongratana) (Obscure flathead)

Key to the species

1a. Pored scales in lateral line 65 or more; vomerine teeth in one transverse patch; dorsal fin with 13 soft rays ..... *P. indicus*

1b. Pored scales in lateral line 60 or fewer; vomerine teeth in two separate patches; dorsal fin with 11 or 12 soft rays 2

2a. Bony ridges above and below eye either with small spines or finely serrated 3

2b. Bony ridges above and below eye with larger spines 4

3a. A stout antrose (forward pointed) spine on lower face of preopercle ..... *R. asper*

3b. No antrose spine on lower face of preopercle ..... *R. melanopterus*

4a. All or most pored scales of lateral line bearing a backwardly directed spine 5

4b. Pored scales of lateral line atleast on posterior half of body without spines 6

5a. Anal fin usually with 12 soft rays; gillrakers on first arch 1 plus 5 or 6; upper preopercular spine not reaching margin of opercular membrane; first dorsal fin with a marginal dark band, without a blotch ..... *G. scaber*

5b. Anal fin usually with 13 soft rays; gillrakers on first arch 1 plus 8; upper preopercular spine long, reaching beyond margin of opercular membrane; first dorsal fin with a large black blotch posteriorly ..... *G. suppositus*

6a. Bony ridges crossing below eye with 3 spines; number of scale rows slanting downward and backward above lateral line greater (by 4 or more scale rows) than number of pored lateral line scales ..... *C. crocodila*

6b. Bony ridges crossing below eye usually with 4 or more spines; number of scale rows slanting downward and backward above lateral line about the same (may differ by 1 or 2) as the number of pored lateral line scales ..... *K. rodericensis*

Fisheries information : The spiny flathead fishes are of no commercial importance. These fishes are often found in the commercial catches.

Order XXVIII PERCIFORMES

Body usually elongate, laterally compressed and covered with scales. Lateral line well developed, usually on upper part of body. Head laterally compressed. Dorsal and anal fins with strong or weak spines. Pelvic fins usually with a strong spine and 5 or less soft rays. Dorsal and anal fins separate from caudal fin. Caudal fin usually forked. It is the most diversified order and not recognized as a monophyletic order. Many

families of this order are poorly defined and very similar, and so, making it difficult to separate them.

Key to families

1a. Pectoral fins divided into two parts: the upper part normal with rays attached, the lower part with 4 to 7 free (unattached) filamentous rays ..... POLYNEMIDAE

1b. Pectoral fins normal, without free rays in lower part of fin, lower rays sometimes separated from each other 2

2a. Two short dorsal fins, widely separated from each other 3

2b. Dorsal fin either one or two (when two), with continuous bases, but if (rarely) fins separate, the inner space is negligible 4

3a. Dorsal fin with 6 to 7 spines ..... APOGONIDAE

3b. Dorsal fin with 5 spines ..... SPHYRAENIDAE

4a. Dorsal and anal fins each with only soft rays, without spines 5

4b. Dorsal and anal fins each with spines and soft rays 7

5a. Head flattened with a characteristic laminated, oval shaped sucking disc ..... ECHENEIDAE

5b. Head without sucking disc 6

6a. Body elongate and compressed; dorsal fin originating on nape, very long, continuing to caudal fin; first pelvic fin ray not prolonged ..... CORYPHAENIDAE

6b. Body disc-like with sharp abdomen; dorsal fin originating far behind head, not extending to caudal fin; first pelvic fin ray in adult prolonged ..... MENIDAE

7a. Pelvic fins with 2 strong spines separated by 3 soft rays ..... SIGANIDAE

7b. Pelvic fins with at most 1 spine or absent 8

8a. Upper jaw prolonged into a long bill 9

8b. Upper jaw normal, not prolonged into a long bill 10

9a. Pelvic fins absent; first dorsal fin short-based, well separated from the second dorsal fin in adults; caudal peduncle with a single median keel on each side ..... XIPHIIDAE

9b. Pelvic fins present; first dorsal fin with very long base, sometimes sail-like, depressible into groove and not well separated from second dorsal fin; caudal peduncle in adults with two keels on each side ..... ISTIOPHORIDAE

10a. Gill openings reduced to a small opening on upper side of head; preopercle with a strong spine ..... CALLIONYMIDAE

10b. Gill openings broad; preopercle without a strong spine 11

11a. Pelvic fins very close together 12

11b. Pelvic fins widely separated 13

12a. Pelvic fins united only at the bases ..... ELEOTRIDAE

12b. Pelvic fins united entirely forming a cup-like structure (sucking disc) .... GOBIIDAE

13a. Anal fin with 1 spine ... PINGUIPEDIDAE

13b. Anal fin with more than 1 spine 14

14a. A single folding lancet-like spine on side of caudal peduncle ..... ACANTHURIDAE

14b. No folding spine on caudal peduncle 15

15a. A single pair of nostrils ..... CICHLIDAE

15b. Two pairs of nostrils 16

16a. Gills 3½, with slit behind, last small or wanting; lower pharyngeals fused into a characteristic structure which bears a strong molar teeth 17

16b. Gills 4, with a long slit behind; lower pharyngeals not fused into one bone and not bearing molar teeth 18

17a. Mouth protractile; jaw teeth mostly separate, usually projecting outward ..... LABRIDAE

17b. Mouth not protractile; jaw teeth fused to form beak-like dental pates ..... SCARIDAE

18a. Anterior part of oesophagus, immediately posterior to last gill arch having lateral pharyngeal sacs supplied in side with papillae or longitudinal folds bearing teeth; small unilateral teeth in jaws 19

18b. No toothed pharyngeal sacs; teeth uniserial to mostly multiserials 21

19a. A continuous dorsal fin or two dorsal fins scarcely separated; pelvic fins absent..... ..... STROMATEIDE

19b. Two dorsal fins distinctly though scarcely separated; pelvic fins always present 20

20a. Dorsal fin with 13 to 16 rays .... ARIOMMATIDAE

20b. Dorsal fin with 25 to 40 rays ....CENTROLOPHIDAE

21a. Premaxillae fixed (non protrusible upper jaw), upper jaw often form a long, forward projecting sword-like structure..... 22

21b. Maxillary bones not very firmly attached to premaxillae and so, free to move forward. 24

22a. Caudal fin always present, well developed, lunate or strongly notched; body spindle-shaped; keels present on caudal peduncle . ..... SCOMBRIDAE

22b. Caudal fin often absent, but if present then not large or lunate-shaped; body oblong or elongate, often ribbon-like; no keel on caudal peduncle 23

23a. Body ribbon-like; single dorsal fin, very long and extending almost entire length of body; no finlets behind dorsal and anal fins; body silvery ..... TRICHIURIDAE

23b. Body elongate and compressed or somewhat fusiform; two dorsal fins; isolated finlets behind dorsal and anal fins usually present; back usually brown..... GEMPYLIDAE

24a. Two long barbels on chin (which can be folded into a median groove on throat); two widely separated dorsal fins... MULLIDAE

24b. No barbels on chin 25

25a. Dorsal fin with 6 to 9 isolated (not connected by membrane) spines, each depressible in a groove; two silvery stripes on sides of body ..... RACHYCENTRIDAE

25b. Dorsal fin without free spines 26

26a. First two anal spines detached from rest of fin (these are partially or completely embedded in large carangids); scutes on straight part of lateral line usually present ..... CARANGIDAE

26b. First two anal spines not detached from rest of fin; no scutes on caudal peduncle 27

27a. Anterior rays of soft dorsal and anal fins markedly elongated, giving both fins a sickle shape; pelvic fins usually small or vestigial ..... MONODACTYLIDAE

27b. Anterior rays of soft dorsal and anal fins not elongated, when elongate they do not give either fin a sickle shape; pelvic fins well developed 28

28a. Dorsal fin inserted in posterior half of body and above anal fin; length of soft dorsal fin base much shorter than soft portion of anal fin; eyes large ..... TOXOTIDAE

28b. Dorsal fin inserted in anterior half of body; length of soft dorsal base not much shorter than soft portion of anal fin; eyes moderate 29

29a. Body very deep, maximum depth more than half of total length; single dorsal fin, spines clearly distinguishable 30

29b. Body oblong or fairly deep, depth less than half of total length; when deep-bodied and

with single dorsal fin, spines absent or the spiny rays hard to distinguish from soft rays 34

30a. No precumbent spine in dorsal fin 31

30b. Precumbent spine in dorsal fin present 32

31a. No spine at angle of preopercle; pelvic axillary process well developed ..... CHAETODONTIDAE

31b. Preopercular spine present; pelvic axillary process not developed ..... POMACANTHIDAE

32a. Anal fin with 4 spines; gill membranes narrowly united to isthmus ..... SCATOPHAGIDAE

32b. Anal fin with 3 spines; gill membranes broadly united to isthmus 33

33a. Mouth protracile; pectoral fins falcate, longer than head length; maxillae distally exposed ..... DREPANIDAE

33b. Mouth not protractile or scarcely so; pectoral fins short, rounded, shorter than head length; maxillae distally hidden ..... EPHIPPIDAE

34a. Two dorsal fins well separated but if close together then not joined by membrane .. 35

34b. Single dorsal fin, sometimes deeply notched between spinous and soft parts of fin but in such cases, the membrane joining the parts intact 40

35a. Anal fin base considerably longer than second dorsal fin bases; mouth large, oblique, with small canine teeth at front ..... LACTARIIDAE

35b. Anal fin base as long as or shorter than second dorsal fin base 36

36a. Preoperculum with a membrane flap over suboperculum present .... POMATOMIDAE

36b. Preoperculum with a membrane flap over suboperculum absent 37

37a. Mouth small, upper jaw (maxilla) ending far short of eye and even before nostrils; maxilla covered by preorbital spine; dorsal fin with 10 to 13 spines ..... SILLAGINIDAE

37b. Mouth moderate in size or large; upper jaw (maxilla) reaching nostrils, but often anterior margin of eye; maxilla not covered by preorbital spine; dorsal fin with 7 to 10 spines 38

38a. Caudal fin rounded ..... LATIDAE

38b. Caudal fin forked 39

39a. Preopercle with a double edge (edge or ridge); anal fin with 3 spines and 9 to 16 rays ..... AMBASSIDAE

39a. Preopercle with a single edge (no ridge); anal fin with 3 spines and 7 rays or 2 spines and 9 or 10 rays ..... ACROPOMATIDAE

40a. Pelvic fins usually with an axillary scale 41

40b. Pelvic fins without an axillary scale 51

41a. Anal fin with 2 spines; lateral line prominent and extends up to hind margin of caudal fin ..... SCIAENIDAE

41b. Anal fin with 3 spines; lateral line not so prominent and not extends up to hind margin of caudal fin 42

42a. Dorsal and anal fins rounded and symmetrical so that with the tail they appear as a single three lobed fin ..... LOBOTIDAE

42b. Dorsal and anal fins not as above 43

43a. Mouth strongly protractile 44

43b. Mouth moderately protractile 45

44a. Head usually naked (but small scales on cheek in few species), upper surface with bony ridges with a nuchal spine on nape; gill membrane united with isthmus ..... LEIOGNATHIDAE

44b. Head entirely covered with clearly visible scales, upper surface smooth; gill membranes free from isthmus ..... GERREIDAE

45a. Distal end of premaxillae overlapping

maxillae externally; molar-like teeth in some species present at sides of jaws; no tooth on roof of mouth ..... SPARIDAE

45b. Maxillae not overlapping by hind tip of premaxillae; no molar-like teeth on jaws 46

46a. Outer row of teeth in jaws of a peculiar hockey-stick shape, with their bases set horizontally, resembling a radially striated bony plate inside mouth .... KYPHOSIDAE

46b. Typical scalpiform teeth absent 47

47a. Suborbital process well developed, sometimes forming a spine posteriorly 48

47b. Suborbital process either absent or weakly developed 50

48a. No teeth on roof of mouth; dorsal and anal fins spines weak ..... NEMIPTERIDAE

48b. Teeth usually on vomer and palatines; dorsal and anal fin spines moderately strong ... 49

49a. Caudal fin deeply forked .... CAESIONIDAE

49b. Caudal fin slightly forked, often truncate or lunate ..... LUTJANIDAE

50a. Dorsal fin with 12 to 16 soft rays; lips not soft and fleshy ..... HAEMULIDAE

50b. Dorsal fin with 9 to 10 soft rays; lips soft and fleshy ..... LETHRINIDAE

51a. Inner ray(s) of pelvic fins attached to abdomen by membrane .... PRIACANTHIDE

51b. Inner ray(s) of pelvic fins not confluent to abdomen by membrane 52

52a. Dorsal and anal fins each with well developed basal scaly sheath; dorsal fin with 10 spines ..... KUHLIDAE

52b. Dorsal and anal fins each without or low basal scaly sheath 53

53a. Mouth large, the upper jaw usually extended to below hind margin of eye; dorsal fin with 7 to 12 spines; operculum with 1 to 3 spines ..... SERRANIDAE

53b. Mouth small or moderate, the upper jaw not reaching beyond eye center; dorsal fin with 11 to 14 spines; operculum with 1 to 2 strong spines ..... TERAPO**NIDAE**

Family 64 AMBASSIDAE
(Glassfishes)

Body more or less translucent and compressed. Mouth large, with fine teeth in jaws and roof of mouth; the upper outer row sometimes enlarge and canine-like. Opercle with an ill-developed spine. Preoperculum with double margin having an edge and ridge. Dorsal fin of two continuous parts defined by a notch. First dorsal fin with 7 spines and a precumbent spine. Second dorsal fin with one spine and 9 to 17 rays. Anal fin with 3 spines and 9 to 16 rays. Caudal fin forked. Lateral line complete, interrupted or very prominently broken.

Species known to occur in Karnataka

1. *Ambassis ambassis* (Lacepede) (Commerson's glassy fish)
2. *Ambassis dussumieri* Cuvier (Malabar glassy perchlet)
3. *Ambassis gymnocephalus* (Lacepede) (Bald glassy fish)
4. *Chanda nama* Hamilton (Elongate glass-perchlet)
5. *Parambassis ranga* (Hamilton) (Indian glassy fish)
6. *Parambassis thomassi* (Day) (Western ghat glassy perchlet)

Key to the species

1a. Scales smaller, 35 to 107 in longitudinal series; tongue edentate; cheek with 4 to 7 transverse scale rows 2

1b. Scales larger, 22 to 30 in longitudinal series; teeth present on tongue; cheek with 1 to 2 transverse scale rows 4

2a. Canine teeth on lower jaw; scales minute, 100 to 107 in longitudinal series; mouth with very prominent lower jaw ..... *C. nama*

2b. No canine teeth on lower jaw; scales moderate, 35 to 63 in longitudinal series; mouth with lower jaw almost equal to upper jaw 3

3a. Lateral line with 35 to 43 scales; cheek with 4 transverse scale row ..... *P. thomasi*

3b. Lateral line with 47 to 63 scales; cheek with 7 transverse scale row ..... *P. ranga*

4a. Lateral line complete, with 16 to 21 scales ..... *A. ambassis*

4b. Lateral line interrupted, with 12 to 16 scales 5

5a. Hind margin of preoperclum finely denticulate; head length about 2.7 times in head length; predorsal scales 15 or 16 .... *A. dussumieri*

5b. Hind margin of preoperclum entire; head length about 2.8 times in head length; predorsal scales 12 or 15 ....*A. gymnocephalus*

Fisheries information : These small fishes are of little commercial value. These are marketed fresh or dried and usually used as bait. *A. ambassis* and *A. gymnocephalus* are fairly common in marine catches.

Remarks : *A. ambassis* was reported as *A. commersoni* Cuvier, a junior synonym of the former. The name *Ambassis gymnocephalus* (Lacepède) is considered as *nomen dubium* (Anderson and Heemstra, 2003). *C. nama* and *P. ranga* are primarily freshwater fishes, but also found in brackish waters.

Family 65 LATIDAE
(Lates perches)

Body elongate and slightly compressed. Mouth large, lower jaw extending to hind border of eye. Preopercle with serrated posterior margin and an enlarged spine at its angle. Opercle with a well defined spine. Dorsal fin deeply notched or separated into two parts, first part with 7 or 8 strong spines and second part with one spine and 10 to 15 rays. Anal fin with 3 spines and 8 to 13 rays. Caudal fin generally rounded. Lateral line complete.

Species known to occur in Karnataka

1. *Lates calcarifer* (Bloch) (Barramundi)

Fisheries information : This is one of the very important commercial fish of our country. Its flesh is considered to be most delicious. Its air bladder is used in making isinglass. Juveniles usually feed and grow in eastuaries.

Remarks : Mooi and Gill (1995) and Otero (2004) gave family status to former subfamily Latinae, separating from Centropomidae.

Family 66 ACROPOMATIDAE
(Lanternbellies)

Body oblong, somewhat compressed. Opercle with 2 or 3 spines. Gill membrane separate, free from isthmus. Gill rakers well developed. Dorsal fins two, divided to base or completely separate; the first with 7 to 10 spines and the second with or without a spine and 8 to 10 soft rays. Anal fin with with 2 to 3 spines and 7 to 9 soft rays. Vent situated near the base of pelvic fin. Usually have a light organ along belly.

Species known to occur in Karnataka

1. *Acropoma japonicum* Gunther (Glowbelly)

Fisheries information : This is a small fish to be of any commercial value, but can be used as food fish.

Family 67 SERRANIDAE
(Groupers, Seabassess)

Body robust or almost compressed, oblong-oval to elongate. Mouth large, maxilla exposed, with or without supramaxilla. Border of preopercle serrate, opercle with 2 or 3 flat spines. Dorsal fin with 7 to 12 spines and 10 to 19 rays. Anal fin

with 3 spines and 7 to 10 rays. Caudal fin usually rounded or truncate, with 15 branched rays. Pelvic fins with 1 spine and 5 rays. Pectoral fins broadly rounded, with the base scaly. Body with variable colour patterns of light or dark stripes, spots, vertical or diagonal bars or almost plain.

Species known to occur in Karnataka

1. *Cephalopholis boenak* (Bloch) (Chocolate hind)
2. *Cephalopholis formosa* (Shaw & Nodder) (Bluelined hind)
3. *Epinephelus aerolatus* (Forsskal) (Areolate grouper)
4. *Epinephelus bleekeri* (Vaillant) (Duskytail grouper)
5. *Epinephelus chabaudi* (Castlenau) (Moustache grouper)
6. ?*Epinephelus chlorostigma* (Valenciennes) (Brownspotted grouper)
7. *Epinephelus coioides* (Hamilton) (Orange-spotted grouper)
8. *Epinephelus diacanthus* (Valenciennes) (Spinycheek grouper)
9. *Epinephelus epistictus* (Temminck & Schlegel) (Dotted grouper)
10. *Epinephelus erythrurus* (Valenciennes) (Cloudy grouper)
11. *Epinephelus fasciatus* (Forsskal) (Blacktip grouper)
12. *Epinephelus faveatus* (Valenciennes) (Barred-chest grouper)
13. *Epinephelus fuscoguttatus* (Forsskal) (Brown-marbled grouper)
14. *Epinephelus lanceolatus* (Bloch) (Giant grouper)
15. *Epinephelus latifasciatus* (Temminck & Schlegel) (Striped grouper)
16. *Epinephelus malabaricus* (Bloch & Schneider) (Malabar grouper)
17. *Epinephelus polylepis* Randall & Heemstra (Smallscaled grouper)
18. *?Epinephelus stoliczkae* Day (Epaulet grouper)
19. *Epinephelus undulosus* (Quoy & Gaimard) (Wavy-lined grouper)

Key to the species

1a. Dorsal fin with 9 spines 2

1b. Dorsal fin with 10 or 11 spines 3

2a. Pectoral fins short, 1.5 to 1.8 times in head length; body brown or yellowish brown, with dark blue lines on head, body and fins ..... *C. formosa*

2b. Pectoral fins longer, 1.3 to 1.6 times in head length; body brown, usually with 7 or 8 dark bars; no blue lines on head or body ..... *C. boenak*

3a. Caudal fin emarginate to truncate 4

3b. Caudal fin rounded 8

4a. Dorsal fin membrane not incised; colour purplish to brownish grey, yellowish brown dots on head and longitudinal brown lines on body ..... *E. undulosus*

4b. Dorsal fin membrane incised; colour not as above 5

5a. Lateral-line scales 48 to 53 6

5b. Lateral-line scales 61 to 72 7

6a. Dorsal fin rays 15 to 17; lower gill rakers 14 to 16; anal fin of adults rounded to slightly angular; pyloric caeca 11 to 17; dark spots on body of adults almost of equal to size of pupil ..... *E. areolatus*

6b. Dorsal fin rays 16 to 18; lower gill rakers 15 to 18; anal fin of adults angular or pointed; pyloric caeca 26 to 52; largest dark spots on body of adults distinctly smaller than size of pupil ..... *E. chlorostigma*

7a. Dorsal fin rays 13 or 14; total gill rakers on first arch 22 to 25; 1 to 4 small spines often present on ventral edge of preopercle near

corner juveniles greyish brown, with 3 faint dark bars dorsally and a dark brown saddle spot on peduncle; large adults grey-brown . ..... *E. chabaudi*

7b. Dorsal fin rays 16 or 17; total gill rakers on first arch 25 to 28; no spines on lower edge of preopercle; head, body and fins with numerous close-set small dark brown spots; rear margin of caudal fin with white edge . ..... *E. polylepis*

8a. Dorsal fin rays 12 or 13; young with 2 broad, longitudinal, black-edged whitish bands that disappear in adults, the dark edges breaking into dashes and spots in adults .... *E. latifasciatus*

8b. Dorsal fin rays 14 to 18; bands as above absent 9

9a. Lateral line scales with branched tubules; eye diameter more than 8 times in head length; juveniles yellow, with 3 broad black bars on body and irregular broad black bands on head ..... *E. lanceolatus*

9b. Lateral line scales usually with a single tubule, except anterior scales; eye diameter less than 8 times in head length; colour of juveniles not as above 10

10a. Numerous distinct dark spots over most of head and body (spots brownish red to black in life and distinct in preservative) 11

10b. No distinct dark spots over most of head and body (spots yellow or orange in life, but indistinct in preservative) 15

11a. Lateral-line scales 48 to 53 12

11b. Lateral-line scales 54 to 65 13

12a. Midlateral-body scales smooth; lower gill rakers 14 to 16; lateral scale series 83 to 98; pectoral fin with dark spots ..... *E. faveatus*

12b. Midlateral-body scales rough; lower gill rakers 16 to 18; lateral scale series 99 to 104; pectoral fin without dark spots .... *E. bleekeri*

13a. Total gill rakers 29 to 31 on first arch; head and body pale yellowish brown, with irregular dark brown blotches and numerous small close-set dark brown spots; black saddle spot on caudal peduncle .... *E. fuscoguttatus*

13b. Total gill rakers 23 to 27 on first arch; colour not as above 14

14a. Irregular white or pale spots or blotches usually present on head and body; head and body with numerous small well-separated black spots, largest spots about twice the size of rear nostrils; pectoral fin rays modally 19 ..... *E. malabaricus*

14b. No white or pale spots on head and body; head, body and usually median fins with numerous orange to reddish-brown spots, largest spots about 4 to 5 times the size of rear nostrils; pectoral fins modally 20 .... *E. coioides*

15a. Spinous dorsal fin membrane usually not incised or slightly incised; head and body dark brown or greenish brown, marbled with irregular pale spots and blotches; 1 or 2 faint dark streaks running posteriorly from eye; no dark spots on head, body or fins .... *E. erythrurus*

15b. Spinous dorsal fin membrane deeply incised; colour not as above 16

16a. Body without dark vertical bars; faint brownish black dots on dorso-lateral part of body; juveniles with dark streaks from eye to operculum ..... *E. epistictus*

16b. Body usually with vertical or slightly oblique broad dark bars 17

17a. Margin of spinous dorsal fin membranes black; edge of orbit narrowly black, surrounded by a pale blue line; body usually with 5 faint dark bars often containing irregular pale spots ..... *E. fasciatus*

17b. Margin of spinous dorsal fin membrane not black; rim of orbit not black 18

18a. Total gill rakers 20 to 23 on first arch; pored lateral line scales 48 to 53; lateral scale series 93 to 106; spots present on head and body ..... *E. stoliczkae*

18b. Total gill rakers 23 to 27 on first arch; pored lateral line scales 52 to 60; lateral scale series 103 to 121; no spots on head and body .... *E. diacanthus*

Fisheries information : These groupers are of highly commercial value and marketed fresh and dried-salted. *E. lanceolatus* is the largest known grouper, but rare in occurrence and is banned under law since it is categorized as Endangered.

Remarks : Several species, *viz.*, *Ceplalopholis argus* (Schneider), *C. aurantia* (Schneider), *C. miniata* (Forsskal), *C. nigripinnis* (Valenciennes), *C. sexmaculata* (Ruppell), *Cromileptes altivelis* (Valenciennes), *Epinephelus caeruleopinnatus* (Bloch), *E. flavocaeruleus* (Lacepede), *E. hexagonatus* (Schneider), *E. longispinnis* (Kner), *E. merra* Bloch, *E. ongus* (Bloch), *E. quoyanus* (Valenciennes), *E. rivulatus* (Valenciennes), *E. tauvina* (Forsskal), *E. tukula* Morgans, *E. undulatus* (Quoy and Gaimard), *Plectropomus maculatus* (Bloch) and *Variola louti* (Forsskal), described as known from west coast of India in Heemstra and Randall (1984) are probably unsubstantiated. All these species are mostly known from reef areas of oceanic islands and not positively recorded from Indian subcontinental coastal waters (Heemstra and Randall, 1993). Hence, these species are not included in the present account considering that those are unlikely to occur along Karnataka coast. *E. coioides* is often misidentified as *E. tauvina*. Inclusion of *Epinephelus chlorostigma* and *E. stoliczkae* is based on report of Rajagopal *et al* (1978), but possibly are misidentifications and need to be verified.

Family 68 PRIACANTHIDAE
(Bigeyes, Bulleyes)

Body oblong, relatively deep and compressed. Eyes very large, in the upper profile of head. Mouth large, with lower jaw projecting. Dorsal fin with 10 spines and 10 to 15 rays. Anal fin with 3 spines and 9 to 16 rays. Pelvic fins with 1 spine and 5 rays, inserted anterior to pectoral fins and broadly united with body by a membrane. Caudal fin slightly emarginate to rounded.

Species known to occur in Karnataka

1. *Heteropriacanthus cruentatus* (Lacepède) (Glasseye)
2. *Priacanthus hamrur* (Forsskal) (Duskyfinned bulleye)
3. *Priacanthus tayenus* Richardson (Purple spotted bigeye)

Key to the species

1a. Dorsal fin with 14 to 15 soft rays; fins dusky to blackish, being darker near borders, a black basal spot on the dorsal surface of pelvic fin bases ..... *P. hamrur*

1b. Dorsal fin with 12 to 13 soft rays; fins not dusky or blackish 2

2a. Pelvic fins and membranes with purplish black spots; other fins plain; length of pelvic fins almost equal to head length, 1.0 to 1.3 times in head length ..... *P. tayenus*

2b. Pelvic fins and membranes without black spots; length of pelvic fins relatively short, 1.5 or slightly more times in head length... ..... *H. cruentatus*

Fisheries information : The Bulleyes are important commercial fishes and marketed fresh.

Family 69 APOGONIDAE
(Cardinal fishes)

Body elongate, oblong and slightly compressed with ctenoid scales. Mouth usually large with teeth generally in villiform bands in jaws, on vomer. Posterior margin of preopercle serrated. Dorsal fin two, the first with 6 to 8 spines and the second with one spine and 8 to 14 branched rays. Anal fin with 2 spines and 8 to 18 branched rays. Pelvic

fins with one spine and 5 branched rays. Lateral line complete.

Species known to occur in Karnataka

1. *Apogon endekataenia* Bleeker (Candystripe cardinalfish)
2. *Cheilodipterus quinquelineatus* (Cuvier) (Five-lined cardinalfish)

Key to the species

1a. Dorsal fin with 6 spines; pectoral fin with 12 or 13 rays; canine teeth and supramaxilla present; body with 5 black longitudinal stripes ..... *C. quinquelineatus*

1b. Dorsal fin with 7 spines; pectoral fin with 14 or 15 rays; canine teeth and supramaxilla absent; body with 6 brown longitudinal stripes ..... *A. endekataenia*

Fisheries information : These small fishes are of no fishery importance.

Family 70 SILLAGINIDAE
(Whitings)

Body elongate and tapering. Operculum with a small, sharp spine. Mouth small, terminal, maxillary end slides below preorbital bone. Dorsal fin two, first dorsal fin with 10 to 13 spines, the second dorsal fin with one spine and 16 to 27 soft rays. Anal fin with 2 spines and 14 to 26 soft rays. Caudal fin emarginate.

Species known to occur in Karnataka

1. *Sillago chondropus* Bleeker (Clubfoot sillago)
2. *Sillago intermedius* Wongratana (Intermediate sillago)
3. *Sillago lutea* McKay (Mud sillago)
4. *Sillago sihama* (Forsskal) (Silver sillago)
5. *Sillago vincenti* McKay (Vincent's sillago)

Key to the species

1a. Pelvic fin spine very small and situated at the base of a thickened club-shaped outer pelvic fin ray; swimbladder without postcoelomic extensions into the tail region .... *S. chondropus*

1b. No club-shaped outer pelvic fin ray; swimbladder with 1 or 2 postcoelomic extensions 2

2a. Swimbladder with 2 posterior extensions 3

2b. Swimbladder with a single posterior extension 4

3a. Body with a longitudinal row of dark spots below the lateral line and a series of dartk saddle-like blotches on back .... *S. intermedius*

3b. Body uniform in colouration ..... *S. sihama*

4a. Swimbladder with a small bulbous anterior projection and without anterolateral extensions projecting anteriorly; second dorsal fin with at least 5 rows of dusky black or black-brown spots ..... *S. vincenti*

4b. Swimbladder with a short median projection and short anterolateral extensions projecting anteriorly; second dorsal fin without dark spots, but may have the membranes tipped with a dusting of very fine black dots .... *S. lutea*

Fisheries information : *S. sihama* is a very common species occurring in both the coasts of India. The whitings are of high commercial and food value.

Family 71 LACTARIIDAE
(False trevallies, Whitefish)

Body oblong and greatly compressed. Mouth large and oblique. Dorsal fin two, the first with 7 or 8 spines and the second with 1 spine and 20 to 22 soft rays. Anal fin with 3 spines and 25 to 28 soft rays. Pelvic fins inserted just below pectoral fins. Caudal fin forked.

Species known to occur in Karnataka

1. *Lactarius lactarius* (Schneider) (False trevally)

Fisheries information : The false trevalllies are of very important commercial fishes. It is marketed fresh or dried salted. *L. lactarius* is a common species occurring in both the coasts of our country.

Family 72 POMATOMIDAE
(Bluefishes)

Body elongate. Mouth large with prominent teeth on jaws. Two separated dorsal fins, the first with 7 to 8 short spines and the second with one spine and 23 to 28 soft rays. Anal fin with 2 to 3 spines and 23 to 27 soft rays. Soft dorsal and anal fins covered with scales at base. Scales small, cycloid. A black blotch at base of pectoral fin.

Species known to occur in Karnataka

1. *Pomatomus saltatrix* (Linnaeus) (Bluefish)

Fisheries information : It is an excellent fish to eat. It is known as the best angling fish as it take almost any moving lure and most flesh. Caught mainly with gillnets, longlines and purse seines. Marketed mostly fresh.

Family 73 CORYPHAENIDAE
(Dolphinfishes)

Body very elongate and compressed with cycloid scales. Mouth large with fine teeth in bands. Adult males have bony crest on front of head. Dorsal and anal fins very long, extending from nape to almost caudal fin, with 52 to 66 rays. Anal fin inserted in thoracic region, fitting into a groove on body. Caudal fin deeply forked, with keels on fin or caudal peduncle. Lateral line curved upward above pectoral fins.

Species known to occur in Karnataka

1. *Coryphaena hippurus* Linnaeus (Dolphin fish)
2. *Coryphaena equiselis* Linnaeus (Common dolphin fish)

Key to species

1a. Dorsal fin rays 48 to 55; a broad and square tooth patch on tongue; greatest depth of body more than 25% of standard length .... *C. equiselis*

1b. Dorsal fin rays 55 to 65; an oval tooth patch on tongue; greatest body depth less than 25% of standard length ..... *C. hippurus*

Fisheries information : The dolphin fishes are of highly flavoured food fish. These fishes are of important commercial value.

Family 74 RACHYCENTRIDAE
(Cobias)

Body elongate, subcylindrical with broad and depressed head. Scales embedded in thick skin. Lateral line slightly wavy in anterior half. Mouth large, terminal; lower jaw projecting. Dorsal fin two, the first with 7 to 9 (generally 8) isolated spines, not connected by membrane; the second with one to 3 spines and 26 to 33 soft rays, anterior rays somewhat elevated in adult specimens. Anal fin long, with 2 weak spines and 22 to 28 soft rays. Pectoral fins pointed, becoming more falcate with the maturity of the fish. Caudal fin lunate in adult specimens, upper lobe longer than lower. Juveniles with caudal fin rounded, the central rays much enlarged. Body with 2 sharply defined narrow light bands.

Species known to occur in Karnataka

1. *Rachycentron canadus* (Linnaeus) (Cobia)

Fisheries information : The cobies are very delicate fishes of commercial importance. These fishes are marketed generally fresh or dried salted.

Family 75 ECHENEIDAE
(Sharksuckers, Remoras)

Body elongate with a transverse laminated, oval-shaped cephalic disc. Head wide, depressed to support disc. Dorsal fin with 18 to 45 rays. Anal fin with 18 to 41 rays. Pectoral fins inserted high on body with 18 to 32 rays. Pelvic fins with one spine and 5 rays, far forward, close together and narrowly or broadly united to underside of body. Caudal fin slightly forked, emarginated or slightly rounded. Body with cycloid scales, generally hidden in skin.

Species known to occur in Karnataka

1. *Echeneis naucrates* Linnaeus (Live sharkshucker)

Fisheries information : This is of minor fishery importance; regularly found in fish markets.

Family 76 CARANGIDAE
(Jacks, trevallies, scads, queenfishes, pampanos)

Body greatly variable, from elongate and fusiform to deep and highly compressed. Gillrakers moderate in length and number to long and numerous, their number decreasing with the maturity in some species. Dorsal fins two, the first with 4 to 8 spines (the spines obsolete or embedded in adult specimens of some species), the second dorsal fin with one spine and 18 to 44 rays. Anal fin with 2 anterior spines (one spine in *Elagatis* and *Seriolina*) separated from rest of the fin by a gap (becoming embedded in adult specimens in some species) followed by one spine and 15 to 39 rays. Pectoral fins with one spine and 14 to 24 rays, either long and falcate or short and pointed or rounded. Pelvic fins with one spine and 5 rays (pelvic fins absent in *Parastromateus*). Caudal fin forked, with lobes generally equal. Caudal peduncle in some species with a moderate lateral keel, bilateral paired keels or dorsal and ventral grooves. Scutes in lateral line present and prominent, or reduced in some species and absent in some genera.

Species known to occur in Karnataka

1. *Alectis ciliaris* (Bloch) (African pompano)
2. *Alectis indicus* (Ruppell) (Indian threadfish)
3. *Alepes djedaba* (Forsskal) (Shrimp scad)
4. *Alepes kleinii* (Bloch) (Razorbelly scad)
5. *Alepes melanoptera* Swainson (Blackfin scad)
6. *Alepes vari* (Cuvier) (Herring scad)
7. *Atropus atropos* (Bloch) (Cleftbelly trevally)
8. *Atule mate* (Cuvier) (Yellowtail scad)
9. *Carangoides armatus* (Ruppell) (Longfin trevally)
10. *Carangoides chrysophrys* (Cuvier) (Longnose trevally)
11. *Carangoides coeruleopinnatus* (Ruppell) (Coastal trevally)
12. *Carangoides ferdau* (Forsskal) (Blue trevally)
13. *Carangoides fulvoguttatus* (Forsskal) (Yellowspotted trevally)
14. *Carangoides malabaricus* (Bloch) (Malabar trevally)
15. *Carangoides praeustus* (Bennett) (Brownback trevally)
16. *Carangoides talamparoides* Bleeker (Imposter trevally)
17. *Caranx heberi* (Bennett) (Blacktip trevally)
18. *Caranx ignobilis* (Forsskal) (Giant trevally)
19. *Caranx melampygus* Cuvier (Bluefin trevally)
20. *Caranx sexfasciatus* Quoy & Gaimard (Bigeye trevally)
21. *Decapterus macrosoma* Bleeker (Shortfin scad)
22. *Decapterus russelli* (Ruppell) (Indian scad)
23. *Megalaspis cordyla* (Linnaeus) (Torpedo scad)
24. *Parastromateus niger* (Bloch) (Black pomfret)
25. *Scomberoides commersonnianus* Lacepede (Talang queenfish)
26. *Scomberoides lysan* (Forsskal) (Doublespotted queenfish)
27. *Scomberoides tala* (Cuvier) (Barred queenfish)
28. *Scomberoides tol* (Cuvier) (Needlescaled queenfish)
29. *Selar crumenophthalmus* (Bloch) (Bigeye scad)
30. *Selaroides leptolepis* (Cuvier) (Yellowstripe scad)
31. *Seriolina nigrofasciata* (Ruppell) (Blackbanded trevally)

32. *Trachinotus baillonii* (Lacepede) (Smallspotted dart)

33. *Trachinotus blochii* (Lacepede) (Snubnose pompano)

34. *Trachinotus botla* (Shaw) (Largespotted dart)

35. *Trachinotus mookalee* Cuvier (Indian pompano)

36. *Uraspis helvola* (Forster) (Whitemouth jack)

Key to the species

1a. Pelvic fin absent in adult; body very deep, about $^{2}/_{3}$ of fork length; dorsal spines embedded in skin, not visible (*Parastromateus*) ..... *P. niger*

1b. Pelvic fin present; body slender to moderate, less than ½ of FL; dorsal fin spines visible 2

2a. Lateral line without scutes 3

2b. Lateral line with hardened scutes on posterior part 11

3a. Dorsal fin spines connected by membranes; gill rakers reduced to 5 small knobs on lower arm of first arch (*Seriolina*) .... *S. nigrofasciata*

3b. Dorsal fin spines low and not connected by membranes; gill rakers on first arch well developed 4

4a. Body low, depth less than ¼ of fork length; soft dorsal and anal fins short (*Scomberoides*) 5

4b. Body high, depth more than $^{1}/_{3}$ of fork length; soft dorsal and anal fins high and sickle-shaped (*Trachinotus*) 8

5a. Total gill rakers on first arch 8 to 15; dorsal fin lobe uniformly pigmented 6

5b. Total gill rakers on first arch 21 to 27; distal half of dorsal fin lobe heavily pigmented with a white basal band 7

6a. Upper jaw extends well beyond posterior margin of eye, especially in adults; teeth of inner and outer rows in lower jaw almost equal in size; sides with large oval blotches above or touching lateral line .... *S. commersonianus*

6b. Upper jaw extends slightly beyond posterior margin of eye; teeth of inner row in lower jaw distinctly larger than those of outer row; sides with vertically elongate blotches intersecting lateral line ..... *S. tala*

7a. A double series of 6 to 8 dusky, round blotches above and below lateral line; scales on midbody below lateral line lanceolate ... . *S. lysan*

7b. Oval or vertically oblong dark blotches along sides of body, first 4 or 5 intersecting lateral line; scales on midbody below lateral line needle-like ..... *S. tol*

8a. Dorsal fin rays 21 to 25; anal fin rays 19 to 24; lower gill rakers 11 to 19; one to six spots along lateral line 9

8b. Dorsal fin rays 18 to 20; anal fin rays 16 to 18; lower gill rakers 8 to 10; no spots on sides of body 10

9a. Anterior two spots on sides of body larger than eye diameter; vomer with a small, oval-shaped tooth patch ..... *T. botla*

9b. All spots on sides of body smaller than eye diameter; vomer with a chevron-shaped tooth patch ..... *T. baillonii*

10a. A narrow band of teeth on tongue; dorsal fin height 24 to 34% of fork length (at 10 to 40 cm fork length size); anal fin lobe yellow without a brownish anterior margin; first predorsal bone inverted 'L'-shaped .... *T. mookalee*

10b. No teeth on tongue; dorsal fin height 35 to 60% of fork length (at 10 to 40 cm fork length size); anal fin lobe usually orange-yellow with a brownish anterior margin; first predorsal bone oval or inverted tear-drop shaped ..... *T. blochii*

11a. Dorsal fin spines longer than soft dorsal fin 12

11b. Dorsal fin spines shorter than soft dorsal fin 21

12a. Dorsal and anal fins followed by finlet(s) 13

12b. Dorsal and anal fins without finlet 16

13a. Dorsal and anal fins with 8 or 9 finlets; straight part of lateral line with 53 to 58 large scutes (*Megalaspis*) ..... *M. cordyla*

13b. Dorsal and anal fins with single finlet; straight part of lateral line with 24 to 50 small to moderate scutes 14

14a. Last ray of dorsal and anal fin finlet-like, attached to fins by membrane; body high and thin, depth about $^1/_3$ of fork length; adipose tissue around eye opened in a narrow slit; shoulder girdle margin smooth (*Atule*) .... *A. mate*

14b. Last ray of dorsal and anal fins detached from fins forming true finlets; body round, depth less than ¼ of fork length; adipose covering around eye opened in a rather wide slit; shoulder girdle margin with 2 papillae (*Decapterus*) 15

15a. Pectoral fin tip reaching a vertical line from second dorsal fin origin; straight part of lateral line with 0 to 4 scales and 30 to 40 scutes ..... *D. russelli*

15b. Pectoral fin tip well short of a vertical line from second dorsal fin origin; straight part of lateral line with 14 to 29 scales and 24 to 40 scutes ..... *D. macrosoma*

16a. Shoulder girdle margin with a furrow ventrally and a large papilla immediately above it (*Selar*) ..... *S. crumenophthalmus*

16b. Shoulder girdle margin smooth, furrow and papilla absent 17

17a. Eyes moderate, about $^1/_3$ of head length; scutes on lateral line less developed; a bright yellow band on lateral line (*Selaroides*) .... *S. leptolepis*

17b. Eyes small, its diameter about ¼ of head length; scutes developed on lateral line; no yellow bands on lateral line (*Alepes*) 18

18a. Ventral profile of body more convex than dorsal profile; a large black blotch on upper margin of opercle and adjacent areas of shoulder ..... *A. kleinii*

18b. Dorsal and ventral profile of body evenly convex; blotch covering upper margin of opercle and adjacent areas of shoulder absent 19

19a. Spinous dorsal fin membrane distinctly jet-black; total gill rakers 24 to 30 on first arch ..... *A. melanoptera*

19b. Spinous dorsal fin not black; total gill rakers 32 to 47 on first arch 20

20a. Total gill rakers on first arch 38 to 47; lateral line scutes 39 to 50; last ray of dorsal and anal fin longer than penultimate ray; a distinct black blotch on upper margin of opercle with a white spot above it ..... *A. djedaba*

20b. Total gill rakers on first arch 32 to 38; lateral line scutes 48 to 69; last ray of dorsal and anal fin about equal in size of penultimate ray; a diffuse dusky blotch on upper margin of opercle, but no white spot ..... *A. vari*

21a. Body high, its depth more than ½ of standard length; some rays of dorsal and anal fin filamentous 22

21b. Body slender, its depth less than ½ of standard length; none of dorsal and anal fin rays filamentous 24

22a. Dorsal fin spines small but distinct; scutes rather strong; pelvic fins black and folded in a ventral groove (*Atropus*) ..... *A. atropos*

22b. Dorsal fin spines vestigial, embedded in the skin and not visible; weak; pelvic fins not black; no ventral groove developed (*Alectis*) 23

23a. Developed gill rakers on lower limb of first arch 12 to 17; depth of suborbital 1.7 to 3.0 times in upper jaw length ..... *A. ciliaris*

23b. Developed gill rakers on lower limb of first arch 21 to 26; depth of suborbital 0.8 to 1.0 times in upper jaw length ..... *A. indicus*

24a. Straight portion of lateral line about equal to the arched portion; tongue, roof and floor of mouth white, rest of mouth dark (*Uraspis*) ..... *U. helvola*

24b. Straight portion of lateral line not equal to that of arched portion; tongue, roof and floor of mouth not pigmented as above 25

25a. Length of straight portion of lateral line longer than arched portion; adipose tissue covers posterior part of eye opening; scutes strong; teeth arranged in a band but outer ones enlarged on both jaws (*Caranx*) 26

25b. Length of straight portion of lateral line shorter than arched portion; adipose tissue not covering eye opening; scutes weak, teeth arranged in a band on both jaws (*Carangoides*) 29

26a. Distal half of upper lobe of caudal fin noticeably black ..... *C. heberi*

26b. Distal half of upper lobe of caudal fin not black 27

27a. Total gill rakers 25 to 29; total soft rays in dorsal and anal fins 39 to 44; maxilla extends utmost to front margin of pupil; scattered small blue-black spots on head and body in specimens above 16 cm fork length..... ..... *C. melampygus*

27b. Total gill rakers 20 to 25; total soft rays in dorsal and anal fins 33 to 39; maxilla extends to below posterior margin of eye; scattered blue-black spots on head and body absent 28

28a. Breast naked ventrally, often with a small patch of scales in front of pelvic fins; upper margin of opercle without a small black spot; second dorsal fin blackish with white tip .. .. *C. sexfasciatus*

28b. Breast completely scaled; upper margin of opercle usually with a small black spot; second dorsal fin uniformly greish without white tip ..... *C. ignobilis*

29a. Anterior part of second dorsal fin with a conspicuous black blotch; vomerine tooth patch with a posterior extension ....*C. praeustus*

29b. Second dorsal fin without black spot; vomerine tooth patch without a posterior extension 30

30a. Dorsal fin rays 25 to 34; anal fin rays 21 to 26 31

30b. Dorsal fin rays 18 to 23; anal fin rays 14 to 20 32

31a. Naked area of breast extends postero-ventrally well beyond origin of pelvic fins; no dusky band on sides of body ....*C. fulvoguttatus*

31b. Naked area of breast not extending postero-ventrally beyond origin of pelvic fins; 5 or 6 dusky bands on sides of body in adults..... .....*C. ferdau*

32a. Naked area of breast separated from naked base of pectoral fin by a broad band of scales .....*C. caeruleopinnatus*

32b. Naked area of breast uninterrupted to naked base of pectoral fins 33

33a. A small naked area anteriorly just above pectoral fin base.....34

33b. Area anteriorly just above pectoral fin base completely scaled 35

34a. Total gill rakers including rudiments on first arch 32 to 38, with 8 to 12 on upper and 21 to 27 on lower arm..... *C. malabaricus*

34b. Total gill rakers including rudiments on first arch 27 to 31, with 6 to 9 on upper and 19 to 22 on lower arm..... *C. talamparoides*

35a. Total gill rakers including rudiments on first arch 31 to 37; lateral line with 11 to 24 scutes; second dorsal fin lobe elongate, longer than

head length; some of dorsal fin rays filamentous ..... *C. armatus*

35b. Total gill rakers including rudiments on first arch 22 to 26; lateral line with 20 to 37 scutes; second dorsal fin lobe falcate, but usually shorter than head length; dorsal fin rays not filamentous ..... *C. chrysophrys*

Fisheries information : The carangids are very important commercial fishes. These are marketed fresh and are most common food fishes.

Remarks : Record of *Caranx gallus* (Gunther) is referable to *Alectis ciliaris* (Bloch); *Selar kalla* (Cuvier) is to *Alepes djedaba* (Forsskal); *Caranx nigrescens* (Bloch) is to *Carangoides chrysophrys* (Cuvier); *Caranx kurra* (Cuvier & Valenciennes) is to *Decapterus russelli* (Ruppell); *Caranx rottleri* (Ruppell) is to *Megalaspis cordyla* (Linnaeus); *Chorinemus tolooparah* (Ruppell) is to *Scomberoides lysan* (Forsskal) and *Caranx sem* Cuvier is to *Caranx heberi* Bennett. Report of *Caranx carangus* Bloch [=*Caranx hippos* (Linnaeus)] is considered here as misidentification of *Caranx ignobilis* (Forsskal) (see Discussion part).

Family 77 MENIDAE
(Moonfishes)

Body greatly compressed and discoid shaped and dorsal profile almost horizontal. Mouth protrudes and having villiform teeth in jaws. Dorsal fin very long and low, anterior rays slightly elevated, with 43 to 46 rays, the first 3 to 19 not branched, spine-like in juveniles. Anal fin also very long and low, with 30 to 33 rays. Pelvic fins with first 2 rays fused and greatly elongated. Pectoral fins with 15 rays, shorter than head. Caudal fin forked. Lateral line extending up to end of dorsal fin base. Body with numerous small round spots on dorsal part.

Species known to occur in Karnataka

1. *Mene maculata* (Bloch) (Moonfish)

Fisheries information : The moonfishes are of minor commercial importance. These fishes are marketed fresh or dried.

Family 78 LEIOGNATHIDAE
(Ponyfishes, Slipmouths)

Body round or oblong, somewhat compressed. Dorsal surface of head with bony ridges and well developed nuchal crest or spine. Mouth small and extremely protrusibble which form a tube when extended. Single dorsal fin, with 8 (rarely 7 or 9) spines and 16 to 17 rays. Anal fin with 3 spines and 13 to 15 rays. Body with minute scales but head without scales. Caudal fin deeply forked or emarginate. Body silvery often wih various markings on body.

Species known to occur in Karnataka

1. *Equulites leuciscus* (Günther) (Whipfin ponyfish)
2. *Eubleekeria splendens* (Cuvier) (Splendid ponyfish)
3. *Gazza achlamys* Jordan & Starks (Smalltoothed ponyfish)
4. *Gazza minuta* (Bloch) (Toothed pony)
5. *Leiognathus berbis* (Valenciennes) (Berber ponyfish)
6. *Leiognathus daura* (Cuvier) (Goldstripe ponyfish)
7. *Leiognathus dussumieri* (Valenciennes) (Dussumier's ponyfish)
8. *Leiognathus equulus* (Forsskal) (Common ponyfish)
9. *Leiognathus fasciatus* (Lacepède) (Striped ponyfish)
10. *Leiognathus lineolatus* (Valenciennes) (Ornate ponyfish)
11. *Nuchequula blochii* (Valenciennes) (Twoblotch ponyfish)
12. *Nuchequula gereoides* (Bleeker) (Decorated ponyfish)
13. *Photopectoralis bindus* (Valenciennes) (Orangefin ponyfish)
14. *Secutor insidiator* (Bloch) (Pugnose ponyfish)

15. *Secutor ruconius* (Hamilton) (Deep pugnose ponyfish)

Key to the species

1a. Caniniform teeth present; mouth pointing forward when protracted (*Gazza*) 2

1b. Caniniform teeth absent.....3

2a. Body depth 2.27 to 3.14 times in standard length; scales on body absent only from breast ahead a line from pectoral fin base to anal fin origin ..... *G. minuta*

2b. Body depth 1.98 to 2.20 times in standard length; scales on body absent anterior to a line from origin of soft dorsal fin to behind pectoral fin base ..... *G. achlamys*

3a. Mouth oblique, pointing upward when protracted (*Secutor*) 4

3b. Mouth horizontal, pointing forward or downward when protracted 5

4a. Lateral line extends to below middle of soft part of dorsal fin; cheek with minute scales ..... *S. ruconius*

4b. Lateral line reaches to below end of dorsal fin; cheek scaleless .....*S. insidiator*

5a. Mouth pointing forward when protracted; ventral profile of body equally convex as dorsal profile; orange blotch on spinous dorsal fin ..... *P. bindus*

5b. Mouth pointing downward when protracted; dorsal profile distinctly more convex than ventral profile; no orange blotch on spinous dorsal fin 6

6a. A dark blotch on nape; upper jaw teeth strongly recurved (*Nuchequula*).....7

6b. No dark blotch on nape; upper jaw teeth not strongly recurved 8

7a. Breast scaled; spinous dorsal fin with a black blotch ..... *N. blochii*

7b. Breast naked; spinous dorsal fin without a blotch ..... *N. gerreoides*

8a. Lower margin of orbit above horizontal line through the gape when mouth closed; body depth less than 2 times in standard length (*Eubleekeria*); dorsal and anal spines stronger; a dark blotch on top of spinous dorsal fin ..... *E. splendens*

8b. Lower margin of orbit tangent to or below horizontal line through the gape when mouth closed; no black blotch on spinous dorsal fin, if blotch present than body depth more than 2 times in standard length 9

9a. Lateral line incomplete; breast entirely scaled (*Equulites*); body depth less than 3 times in standard length; second dorsal spine elongate ..... *E. leuciscus*

9b. Lateral line complete; breast scaled or naked (*Leiognathus*) 10

10a. A black blotch on dorsal fin; a broad, yellow band along lateral line; back with out marking; breast scaleless ..... *L. daura*

10b. Black blotch on dorsal fin and yellow band along lateral line absent; vermiculate markings or bars on back 11

11a. Body deeper, depth less than 2 times in standard length; breast scaleless 12

11b. Body slender, depth more than 2 times in standard length; breast scaled 13

12a. Second dorsal spine distinctly elongate; a series of oval yellow spots below lateral line; about 11 widely spaced dark vertical lines on back .....*L. fasciatus*

12b. Second dorsal spine normal, not elongate; series of yellow blotches below lateral line absent; closely set faint narrow vertical bars on back ..... *L. equulus*

13a. Body depth 2.02 to 2.28 times in standard length; grey wavy vertical bars on back to little below lateral line ..... *L. dussumieri*

13b. Body depth 2.32 to 2.98 times in standard length; back with vermiculated markings to little below lateral line 14

14a. Dorsal profile of nape evenly curved, without a notch; vermiculate markings on back fewer, very few curved lines below lateral line.... ..... *L. lineolatus*

14b. Dorsal profile of nape with a distinct notch; vermiculate markings on back crowded, more vertical lines below lateral line.... *L. berbis*

Fisheries information : The ponyfishes are of minor commercial importance since they provide a small amount of low cost protein. These are mostly captured at small size and reduced to fishmeal.

Remarks : The generic allocations are in current parllence of nomenclature (Froese and Pauly, 2009). Records of *L. brevirostris* (Valenciennes) are referable to *Nuchequula gereoides* (Bleeker) (see Discussion part).

Family 79 LUTJANIDAE
(Snappers)

Body more or less oblong to deep, with ctenoid scales. Cheek and preopercle with scales, but scales absent between mouth and eye. Mouth terminal, moderate to large. Maxilla slips below preorbital when mouth closed. Preopercle generally serrate, often finely. Dorsal fin continuous or with a shallow notch, with 10 to 12 spines and 10 to 17 rays. Anal fin with 3 spines and 7 to 11 rays. Caudal fin of various shapes ranging from lunate, emarginate, truncate to slightly forked.

Species known to occur in Karnataka

1. *Aphareus furcatus* (Lacepede) (Small toothed jobfish)
2. *Aphareus rutilans* Cuvier (Rusty jobfish)
3. *Aprion virescens* Valenciennes (Green jobfish)
4. ?*Aspilus fuscus* Valenciennes (African forktail snapper)
5. *Etelis carbunculus* Cuvier (Ruby snapper)
6. *Etelis coruscans* Valenciennes (Flame snapper)
7. *Lipocheilus carnolabrum* (Chan) (Tang's snapper)
8. *Lutjanus argentimaculatus* (Forsskal) (Mangrove red snapper)
9. *Lutjanus bengalensis* (Bloch) (Bengal snapper)
10. *Lutjanus bohar* (Forsskal) (Two-spot red snapper)
11. *Lutjanus ehrenbergii* (Peters) (Blackspot snapper)
12. *Lutjanus erythopterus* Bloch (Crimson snapper)
13. *Lutjanus fulviflamma* (Forsskal) (Dory snapper)
14. *Lutjanus fulvus* (Schneider) (Blacktail snapper)
15. *Lutjanus gibbus* (Forsskal) (Humpback red snapper)
16. *Lutjanus johnii* (Bloch) (John's snapper)
17. *Lutjanus kasmira* (Forsskal) (Common bluestripe snapper)
18. *Lutjanus lemniscatus* (Valenciennes) (Yellowstreaked snapper)
19. *Lutjanus lunulatus* (Park) (Lunartail snapper)
20. *Lutjanus lutjanus* Bloch (Bigeye snapper)
21. *Lutjanus madras* (Valenciennes) (Indian snapper)
22. *Lutjanus malabaricus* Schneider (Malabar blood snapper)
23. *Lutjanus monostigma* (Cuvier) (Onespot snapper)
24. *Lutjanus quinquelineatus* (Bloch) (Five-lined snapper)
25. *Lutjanus rivulatus* (Cuvier) (Blubberlip snapper)
26. *Lutjanus russelli* (Bleeker) (Russell's snapper)
27. *Lutjanus sanguineus* (Cuvier) (Humphead snapper)

28. *Lutjanus sebae* (Cuvier) (Emperor red snapper)
29. *Lutjanus vitta* (Quoy & Gaimard) (Brownstripe red snapper)
30. *Macolor niger* (Forsskal) (Black and white snapper)
31. *Paracaesio xanthura* (Bleeker) (Yellowtail blue snapper)
32. *Pinjalo pinjalo* (Bleeker) (Pinjalo)
33. *Pristipomoides filamentosus* (Valenciennes) (Crimson jobfish)
34. *Pristipomoides multidens* (Day) (Goldbanded jobfish)
35. *Pristipomoides sieboldii* (Bleeker) (Lavender jobfish)
36. ?*Pristipomoides typus* Bleeker (Sharptooth jobfish)
37. *Pristipomoides zonatus* (Valenciennes) (Oblique-banded snapper)

Key to the species

1a. Dorsal and anal fin bases scaleless; caudal fin deeply forked 2

1b. Dorsal and anal fin bases scaled on its soft part; caudal fin slightly forked, lunate truncate, or emarginate 13

2a. Dorsal fin deeply notched dividing spinous and soft parts; maxilla scaled 3

2b. Dorsal fin not deeply notched; maxilla usually scaleless 4

3a. Total gill rakers on lower limb of first arch 11 to 14, including rudiments; upper lobe of caudal fin 26 to 30 percent of standard length ..... *E. carbunculus*

3b. Total gill rakers on lower limb of first arch 15 to 18, including rudiments; upper lobe of caudal fin 33 to 60 percent of standard length ..... *E. coruscans*

4a. Pectoral fins short, its length about equal to length of snout; a deep groove in front of eye present ..... *A. virescens*

4b. Pectoral fin long, much longer than snout length; no groove before eye 5

5a. Vomer and palatines without teeth; teeth in jaws minute, no canines 6

5b. Vomer and palatines with villiform teeth; teeth in jaws larger, usually with enlarged canines at front 7

6a. Lower gill rakers 16 to 18 on first arch ..... *A. furcatus*

6b. Lower gill rakers 30 to 34 on first arch ..... *A. rutilans*

7a. Last ray of dorsal and anal fins distinctly longer than penultimate ray 8

7b. Last ray of dorsal and anal fins not longer than penultimate ray 12

8a. Lower gill rakers 19 to 22; lateral line scales 70 to 74; vomerine tooth patch roughly diamond shaped or triangular with a posterior extension ..... *P. sieboldii*

8b. Lower gill rakers 11 to 16; lateral line scales 48 to 65; vomerine tooth patch mostly triangular, without posterior extension or V-shaped 9

9a. Lateral line scales 48 to 52; top of head with yellowish bars and spots 10

9b. Lateral line scales 58 to 66; top of head without yellow bars or spots 11

10a. Two orange stripes on sides of snout; markings on top of head as transverse bars and some irregular chevron shaped ..... *P. multidens*

10b. No stripes on sides of snout; markings on top of head as longitudinal vermiculated lines and spots ..... *P. typus*

11a. Body depth 3.3 to 3.6 times in standard length; body colour uniform, without yellow or orange bars on sides ..... *P. filamentosus*

11b. Body depth 2.6 to 2.8 times in standard length; 4 oblique yellow or orange bars on sides of body ..... *P. zonatus*

12a. Upper lip with a median fleshy protuberance; dorsal spines thick and robust; upper jaw extends to middle of eye or beyond .... *L. carnolabrum*

12b. Upper lip without a fleshy protuberance; dorsal spines relatively feeble to moderate; upper jaw extends utmost to anterior margin of pupil 13

13a. Lateral line scales 62 to 68; lower gill rakers 20 to 23 on first arch; back and sides dark brown ..... *A. fuscus*

13b. Lateral line scales 70 to 72; lower gill rakers 18 to 20 on first arch; back with a broad yellow area from nape to caudal peduncle ..... *P. xanthura*

14a. Gill rakers more than 50 on lower arm of first arch ..... *M. niger*

14b. Gill rakers less than 20 on lower arm of first arch 15

15a. Scale rows below lateral line obliquely sloping upward and backward; upper and lower profiles of head equally rounded; lower edge of eye below line from snout tip to middle of caudal fin base ..... *P. pinjalo*

15b. Scale rows below lateral line usually horizontal; upper and lower profiles of head unequal with flattened lower profile; lower edge of eye generally above line from snout tip to middle of caudal fin base 16

16a. Longitudinal scale rows above lateral line horizontal (parallel to lateral line) or rising in posterior portion 17

16b. Longitudinal scale rows above lateral line rising obliquely 19

17a. Ground colour usually reddish-brown or dusky; black blotch below soft dorsal fin absent ..... *L. argentimaculatus*

17b. Ground colour pale; a black blotch below soft dorsal fin present 18

18a. Preorbital space narrow, 8.5 to 10.3 times in head length; vomerine tooth patch with a short posterior extension ..... *L. ehrenbergii*

18b. Preorbital space wide, 4.8 to 6.0 times in head length; vomerine tooth patch without posterior extension ..... *L. johnii*

19a. Body slender, depth usually 2.9 to 3.3 times in standard length; preorbital space very narrow, 9.2 to 16.3 times in head length... ..... *L. lutjanus*

19b. Body deeper, depth usually less than 3.0 times in standard length; preorbital space wider, 3.3 to 8.9 times in head length....20

20a. Body pale in colour with 4 to 6 longitudinal stripes on sides 21

20b. Body colour not as above 23

21a. Dorsal fin spines 11 or 12; lower gill rakers 17 to 19 ..... *L. bengalensis*

21b. Dorsal fin spines 10; lower gill rakers 13 to 15 22

22a. Five or six scale rows on cheek; four stripes on sides ..... *L. kasmira*

22b. Ten or eleven scale rows on cheek; five stripes on sides ..... *L. quinquelineatus*

23a. Vomerine tooth patch with a short or long posterior extension 24

23b. Vomerine tooth patch crescentic or triangular without posterior extension 27

24a. A black blotch present below soft dorsal fin 25

24b. No black blotch below soft dorsal fin ...26

25a. Black spot below dorsal fin placed mainly above lateral line; wide gape between temporal scale bands on each side; young with 4 to 7 blackish to orange or yellow-brown stripes on sides, upper ones rising obliquely ..... *L. russelli*

25b. Black spot below dorsal fin bisected by lateral line; little or no gape between temporal scale bands on each side; young without stripes ..... *L. fulviflamma*

26a. Lower gill rakers 9 to 12; preorbital width about equal to eye diameter; midlateral stripe broader and darker ..... *L. vitta*

26b. Lower gill rakers 12 to 15; preorbital width about $^{2}/_{3}$ of eye diameter; midlateral stripe not broader and darker ..... *L. madras*

27a. Scale rows below lateral line rising obliquely as the lines above it; total gill rakers 25 to 30 on first arch ..... *L. gibbus*

27b. Scale rows below lateral line almost horizontal; total gill rakers 14 to 23 on first arch 28

28a. Dorsal fin soft rays 15 or 16; depth 2.0 to 2.4 in standard length 29

28b. Dorsal fin soft rays 13 or 14; depth 2.3 to 3.0 in standard length 30

29a. Dorsal fin with 10 spines; anal fin rays 8; brown with reddish tinge in adult, head with numerous undulating blue-lines; juveniles with a series of 3 to 8 brown bars on sides and a chalky-white spot ..... *L. rivulatus*

29b. Dorsal fin with 11 spines; anal fin rays 10; red or pink in adults, no blue lines on head; juveniles and smaller adults pink with a dark red band ..... *L. sebae*

30a. Preopercular notch well developed; caudal fin and distal third of dorsal fin blackish or dusky brown with a narrow white border.. ..... *L. fulvus*

30b. Preopercular notch poorly developed; caudal fin yellow or grey basally and yellow distally without narrow white border; distal third of dorsal fin not noticeably darker than remainder of fin 31

31a. Gill rakers on first arch 22 or 23; nostrils in a groove before eyes in larger adults; smaller specimens with two white spots on back, one below spinous dorsal fin and second below posterior part of soft dorsal fin ... *L. bohar*

31b. Gill rakers on first arch 15 to 21; nostrils not placed in a groove; white spots on back absent 32

32a. Caudal fin with a characteristic crescentic black marking ..... *L. lunulatus*

32b. Caudal fin with a without crescentic black marking 33

33a. A black spot on lateral line below soft dorsal fin ..... *L. monostigma*

33b. Black spot on lateral line absent 34

34a. Tongue with a patch of fine, granular teeth; total gill rakers 15 to 18 on first arch; no black saddle on upper caudal peduncle in juveniles ..... *L. lemniscatus*

34b. Tongue smooth, without teeth; total gill rakers 18 to 21 on first arch; juveniles with a black saddle on upper caudal peduncle 35

35a. A prominent hump on forehead and a series of shallow, horizontal grooves behind eye in large adults; nostrils widely separated, the distance between them much greater than length of posterior nostril opening .... *L. sanguineus*

35b. Hump on forehead and grooves behind eye absent; nostrils close-set, the distance between them about equal or less than length of posterior nostril opening 36

36a. Maxilla length much less than distance between bases of last dorsal and anal rays; a large black spot (not touching ventral profile) at base of caudal fin with a pearly-white anterior border on upper half in juveniles . ..... *L. erythropterus*

36b. Maxilla length about equal to distance between bases of last dorsal and anal rays; a prominent black band (touching both dorsal and ventral profile) across caudal peduncle with a pearly-white anterior border in juveniles ..... *L. malabaricus*

Fisheries information : Snappers are very important commercial fishes. *L. johnii* is the most common species in estuaries and coastal waters.

Remarks : Allen (1985) stated that 'records of *Aspilus fuscus* Valenciennes from the Indian Ocean probably based on misidentification'.

Inclusion of *A. fuscus* here is based on Allen (1984) and that needs material confirmation. *Etelis marshi* (Jenkins) is relegated to the synonymy of *Etelis carbunculus* Cuvier (Allen, 1985). Although *Pristipomoides typus* Bleeker has been reported (Allen, 1984) from west coast of India, it needs to be confirmed (Allen, 1985). *Lutjanus coeruleolineatus* is restricted to north-west Arabian Sea (Allen, 1985). Report of *Lutianus sillaoo* (Russell) is referable to *Lutjanus argentimaculatus* (Forsskal).

Family 80 CAESIONIDAE
(Fusiliar fishes)

Body oblong to fusiform and almost compressed, with ctenoid scales. Mouth small, oblique and highly protrusible; ascending premaxillary process a separate ossification from premaxilla. Dorsal fin with 10 to 15 slender weak spines and 8 to 22 rays. Anal fin with 3 spines and 9 to 13 rays. Pelvic fins with 1 spine and 5 rays. Pectoral fins with 16 to 24 rays. Caudal fin deeply forked. Lateral line with 45 to 88 scales. Body with or without longitudinal stripes. Caudal fin with a blackish blotch on tips of lobes or with a longitudinal blackish streak in middle of each lobe or without any markings.

Species known to occur in Karnataka

1. *Caesio caerulaurea* Lacepede (Blue and gold fusiliar)
2. *Gymnocaesio gymnoptera* (Bleeker) (Slender fusiliar)
3. *Pterocaesio chrysozona* (Cuvier) (Gold band fusiliar)
4. *Pterocaesio pisang* (Bleeker) (Banana fusiliar)
5. *Pterocaesio tile* (Cuvier) (Dark banded fusiliar)

Key to the species

1a. A single postmaxillary process, posterior end of maxilla blunt; its greatest depth posterior to end of premaxilla ..... *C. caerulaurea*

1b. Two postmaxillary processes, posterior end of maxilla tapered; its greatest depth anterior 2

2b. Dorsal and anal fins without scales; premaxilla without teeth ..... *G. gymnoptera*

2b. Dorsal and anal fins scaled; premaxilla with small conical teeth, sometimes restricted to front of jaw 3

3a. Dorsal fin with 11 or 12 (rarely10) spines and 19 to 22 soft rays; a blackish streak in each caudal lobe ..... *P. tile*

3b. Dorsal fin with 10 to 11 (usually 10) spines and 14 to 16 soft rays; tips of caudal lobes with a blackish blotch 4

4a. Body without stripes on side, its colour reddish or greenish blue ..... *P. pisang*

4b. Body with 1 or 2 yellow stripes on side in life ..... *P. chrysozona*

Fisheries information : The caesionids are of minor commercial importance. These fishes are generally used as tuna baitfish.

Family 81 LOBOTIDAE
(Trippletail fishes)

Body deep, oblong. more or less compressed with ctenoid scales. Body depth much greater than head length. Upper jaw slightly protrusible. Preopercle coarsely serrated and opercle with 1 to 2 flat spines. Dorsal fin very long and broadly rounded, with 11 to 13 spines and 13 to 16 rays. Anal fin very long and broadly rounded, with 3 spines and 9 to 12 rays. Caudal fin rounded. Round soft dorsal and anal fins reaching past caudal fin base, resembling the fish with three tails.

Species known to occur in Karnataka

1. *Lobotes surinamensis* (Bloch) (Trippletail fish)

Fisheries information : It is a valuable commercial fish for its quality flesh. It is marketed fresh.

Family 82 GERREIDAE
(Mojarras, Silver-biddis)

Body compressed and dorsal profile more or less elevated, with shiny scales. Mouth greatly protrusible, extending downwards when protracted. Dorsal fin with 9 to 10 spines and 9 to 15 rays. Anal fin with 3 to 5 spines and 7 to 13 rays. Dorsal and anal fin bases with an elevated scaly sheath. Pelvic fins with 1 spine and 5 rays, a scaly flap present at the base of spine. Pectoral fins long and pointed. Caudal fin forked. Lateral line complete, with 33 to 48 scales.

Species known to occur in Karnataka

1. *Gerres erythrourus* (Bloch)(Deepbodied mojarrah)
2. *Gerres filamentosus* Cuvier (Whipfin silverbiddy)
3. *Gerres limbatus* Cuvier (Saddleback silver-biddy)
4. *Gerres oblongus* Cuvier (Slender silver-biddy)
5. *Gerres oyena* (Forsskal) (Common silver biddy)
6. *Gerres phaiya* Iwatsuki & Heemstra (Strong spined silver-biddy)
7. *Gerres setifer* (Hamilton) (Small Bengal silver-biddy)
8. *Pentaprion longimanus* (Cantor) (Longfin mojarra)

Key to the species

1a. Anal fin long, with 5 spines and 12 to 14 soft rays ..... *P. longimanus*

1b. Anal fin short with 3 spines and 7 soft rays 2

2a. Dorsal fin with 10 spines ..... *G. setifer*

2b. Dorsal fin with 9 spines 3

3a. Second spine of dorsal fin greatly elongated forming a long filament, longer than head length ..... *G. filamentous*

3b. Second dorsal fin spine not greatly elongated and filamentous structure, usually much less than head length 4

4a. Body elongate, its depth at least 3 times in standard length 5

4b. Body relatively deep, its depth less than 3 times (1.9 to 2.8) in standard length 6

5a. Scales between lateral line and base of 5th dorsal spine 3.5 rows; lateral line with 35 to 39 scales ..... *G. oyena*

5b. Scales between lateral line and base of 5th dorsal spine 4.5 to 5.5 rows; lateral line with 44 to 48 scales ..... *G. oblongus*

6a. Pectoral fin short, not extending up to origin of anal fin ..... *G. limbatus*

6b. Pectoral fin relatively longer, extending up to origin of anal fin 7

7a. Body deep, its depth 2.0 to 2.3 times in standard lengh, forming sharp angles at dorsal fin origin; lateral line scales 38 to 41 ..... *G. erythrourus*

7b. Body oblong, its depth 2.2 to 2.8 times in standard length; lateral line scales 34 to 38 ..... *G. phaiya*

Fisheries information : The fishes of this family are of important commercial value.

Remarks : *Gerres abbbreviatus* Bleeker is relegated to synonymy of *Gerres erythrourus* (Bloch) (Iwatsuki *et al*, 1998) and *Gerres lucidus* Cuvier, to *Gerres limbatus* Cuvier (Iwatsuki *et al*, 2001a). Since *Gerres poeti* Cuvier, 1829 was found to be a junior synonym of *Gerres longirostris* (Lacepede) (Iwatsuki *et al*, 2001b) and for our specimens reffered to as *Gerres poeti* Cuvier, 1830, being it a preoccupied name, a replacement name *Gerres phayia* is considered (Iwatsuki and Heemstra, 2001).

Family 83 HAEMULIDAE
(Grunts, Sweetlips, Hotlips)

Body oblong and compressed with ctenoid

scales. Mouth with thick lips, tips of upper jaw hidden when mouth closed. Chin with 2 pores and a pit or 6 pores and no pit (in the genus *Plectorhinchus).* Preopercle with a slightly concave and serrated margin, opercle with one indistinct spine. Dorsal fin with 9 to 15 spines and 12 to 26 rays. Pectoral fins long, its first ray sometimes forming a short filament. Pelvic fins inserted below pectoral fin base, with 1 spine and 5 rays. Anal fin with 3 spines, the second often very strong and 7 to 9 rays. Caudal fin truncate or emarginated (rounded in juveniles).

Species known to occur in Karnataka

1. *Diagramma pictum* (Thunberg) (Pointed sweetlips)
2. *Plectorhinchus gibbosus* (Lacepede) (Harry hotlips)
3. *Plectorhinchus griseus* (Cuvier) (Grey sweetlips)
4. *Plectorhinchus orientalis* (Bloch) (Orientalis sweetlips)
5. *Plectorhinchus pictus* (Tortonese) (Trout sweetlips)
6. *Plectorhinchus polytaenia* (Bleeker) (Ribbon sweetlips)
7. *Plectorhinchus schotaf* (Forsskal) (Minstrel sweetlips)
8. *Pomadasys argenteus* (Forsskal) (Silver grunt)
9. *Pomadasys argyreus* (Valenciennes) (Bluecheek silver grunt)
10. *Pomadasys commersonnii* (Lacepède) (Small spotted grunt)
11. *Pomadasys furcatus* (Schneider) (Banded grunt)
12. *Pomadasys kaakan* (Cuvier) (Javelin grunter
13. *Pomadasys maculatum* (Bloch) (Saddle grunt)
14. *Pomadasys multimaculatum* (Playfair) (Cock grunter)
15. *Pomadasys olivaceum* (Day) (Olive grunt).

Key to the species

1a. Chin with 2 pores followed by a pit containing a pore on each side; fin spines strong; second anal fin spine often enlarged 2

1b. Chin with 6 pores and no median pit; fin spines often weak; second anal fin spine not enlarged 9

2a. Nape and back with a series of incomplete broad cross-bars; spinous part of dorsal fin with a large black blotch ..... *P. maculatum*

2b. Nape and back without broad bands; no large black blotch on dorsal fin 3

3a. Body uniform, without spots or stripes 4

3b. Body usually spotted or with stripes 5

4a. Anal fin with 11 or 12 rays; operculum edge with a large blotch bordered by yellow anteriorly ..... *P. olivaceum*

4b. Anal fin with 7 or 8 rays; operculum with a blue-black blotch in juveniles, indistinct in adults ..... *P. argyreus*

5a. A row of fine interradial scales behind dorsal and anal fin rays, above the basal sheath; about 6 dark stripes on back and flanks .... *P. furcatus*

5b. No fine interradial scales behind dorsal and anal fin rays; dark stripes on back and flanks absent, but body spotted 6

6a. Lateral line scales 50 to 54; body with scattered round spots 7

6b. Lateral line scales 44 to 48; body uniform silvery in adults 8

7a. Spots only on body, absent on head and snout; a black blotch on operculum; anal fin rays 8 to 10 ..... *P. commersonii*

7b. Spots also present on head and snout; no black blotch on operculum; anal fin with 7 rays ..... *P. multimaculatum*

8a. Body with pairs of spots or dull blotches

arranged into vertical interrupted bars, that disappear with age; dorsal fin with two rows of black spots; scale rows between lateral line and dorsal fin origin 7 ..... *P. kaakan*

8b. Body with rounded spots, scattered on body in adult or forming thin, longitudinal irregular wavy lines or rows of spots on back in juveniles; scale rows between lateral line and dorsal fin origin 5 ..... *P. argenteus*

9a. Dorsal fin with 9 or 10 spines and 21 to 26 soft rays; 20 to 25 scales between lateral line and dorsal fin origin ..... *D. pictum*

9b. Dorsal fin with 11 to 14 spines and 14 to 23 soft rays; 10 to 17 scales between lateral line and dorsal fin origin 10

10a. Body uniform grey, grayish-brown to brown 11

10b. Body colour variable with bands and/or spots 13

11a. Dorsal fin with 14 spines and 15 or 16 rays; colour grey to brown or blackish, juveniles with yellowish tail ..... *P. gibbosus*

11b. Dorsal fin with 12 spines and 18 to 23 rays 12

12a. Dorsal fin rays 21 to 23; lateral line scales about 70; colour grayish-brown, reddish on head ..... *P. griseus*

12b. Dorsal fin rays 18 to 20; lateral line scales about 55; posterior margin of opercle and preopercle with a red line; lips scarlet..... ..... *P. schotaf*

13a. Dorsal fin soft rays 15 or 16; gill rakers on first arch 22; round black spots on back and flanks; young with 3 longitudinal brownish bands, many dark spots between upper two bands, bands disintegrate into blotches with age ..... *P. pictus*

13b. Dorsal fin soft rays 17 to 22; gill rakers on first arch 25 to 35; colour not as above, with bands and blotches 14

14a. Dorsal fin rays 20 to 22; lateral line scales about 55; brown, with 9 grey, yellow or white longitudinal bands on head and sides .... *P. polytaenia*

14b. Dorsal fin rays 17 to 20; lateral line scales about 65; colour variable, juveniles with connected black blotches that gradually break up in adults into horizontal bands which unite at tip of snout ..... *P. orientalis*

Fisheries information : These fishes are of minor fishery interest as they are not considered as good food fish although *P. kaakan* and *P. maculatum* are very common in occurrence.

Remarks : *Pomadasys hasta* (Bloch, 1790) has been considered as a junior synonym of *Pomadasys argenteus* (Forsskal) (McKay, 2001; Eschmeyer, 2009). Along Indian coast (Talwar and Kacker, 1984), the former name is misapplied to *Pomadasys kaakan* (Cuvier, 1830). *Pomadasys nigrus* (Cuvier, 1830) has been considered as a junior synonym of *Pomadasys gibbosus* Lacepede (McKay, 1984; Smith & McKay, 1986; McKay, 2001). Froese and Pauly (2009) treated it as a valid species, but not distinguishable from the other one. Hence, both are considered conspecific here. Although McKay (1984) has treated *Plectorhinchus griseus* (Cuvier) as a distinct species, Roux (1986) has considered it as a junior synonym of *Plectorhinchus schotaf* (Forsskal).

Family 84 NEMIPTERIDAE
(Threadfin breams, Monocle breams)

Body elongate to almost deep and compressed. Mouth terminal, small to moderate; premaxillaries more or less protrusible. Dorsal fin continuous with 10 spines and 9 rays. Anal fin with 3 spines and 7 rays. Pectoral fins with 2 unbranched and 12 to 17 branched rays. Pelvic fins inserted in thoracic region, with 1 spine and 5 rays. Caudal fin emaginate, forked, lunate or falcate; the upper and/ or lower tips of the fin with or without elongated or filamentous extensions.

Species known to occur in Karnataka

1. *Nemipterus bipunctatus* (Valenciennes) (Delagoa threadfin bream)

2. *Nemipterus japonicus* (Bloch) (Japanese threadfin bream)
3. *Nemipterus randalli* Russell (Randall's threadfin bream)
4. *Nemipterus zysron* (Bleeker) (Slender threadfin bream)
5. *Parascolopsis aspinosa* (Rao & Rao) (Smooth dwarf monocle bream)
6. *Parascolopsis townsendi* Boulenger (Scaly dwarf monocle bream)
7. *Scolopsis vosmer*i (Bloch) (Whitecheek monocle bream)

Key to the species

1a. Second spine of anal fin stronger and longer; 4 to 7 rows of scales on preopercle; no canine teeth on jaws 2

1b. Second spine of anal fin weak; 3 rows of scales on preopercle; 3 or 4 pairs of canine teeth present at least in upper jaw 4

2a. A backward pointing distinct suborbital spine with a small antrorse spine below eye; body depth 2.0 to 2.5 in standard length; posterior margin of preopercle coarsely serrate; a broad white vertical bar across opercle .... *S. vosmeri*

2b. Suborbital spine weak or rudimentary; no antrorse spine below eye; body depth 2.5 to 3.0 in standard length; posterior margin of preopercle finely serrate; no white bar across opercle 3

3a. Suborbital scaly; maxilla scaly or naked; lateral line scales 37 to 40; no black blotch at base of dorsal fin ..... *P. townsendi*

3b. Suborbital and maxilla naked; lateral line scales 35 or 36; a black blotch at base of last three spines of dorsal fin ..... *P. aspinosa*

4a. Upper lobe of caudal fin pointed, not produced into filament; scales below lateral line in ascending rows anteriorly..... .....*N. bipunctatus*

4b. Upper lobe of caudal fin produced into a narrow filament; scales below lateral line more or less in horizontal rows 5

5a. Pectoral fins short, not reaching to level of anal fin origin; caudal filaments short; three broad yellow bands on head .....*N. zysron*

5b. Pectoral fins long, reaching to or beyond level of anal fin origin; caudal filaments long; no broad yellow band on head 6

6a. Pelvic fins short, not reaching to level of anal fin origin .....*N. japonicus*

6b. Pelvic fins long, reaching to or beyond level of anal fin origin .....*N. randalli*

Fisheries information : The threadfin breams are of considerable commercial importance. Occurrence of *N. japonicus* and *S. vosmeri* are very common along our coast. *S. vosmeri* is a hardy species and can be maintained in aquarium.

Family 85 LETHRINIDAE
(Emperor fishes)

Body generally oblong and compressed. Mouth terminal, lips usually soft and fleshy; upper jaw protrusible. Hind margin of preopercle smooth. Cheek without scales. Dorsal fin with 10 spines and 9 to 10 soft rays. Anal fin with 3 spines and 6 to 10 soft rays. Caudal fin emarginate or forked, with 7 to 9 procurrent caudal rays. Lateral line complete.

Species known to occur in Karnataka

1. *Gnathodentex aurolineatus* (Lacepede) (Striped large eye bream)
2. *Gymnocranius elongatus* Setna (Forked tail large eye bream)
3. *Gymnocranius grandoculis* (Valenciennes) (Blue-lined large eye bream)
4. *Lethrinus lentjan* (Lacepede) (Pink ear emperor)
5. *Lethrinus nebulosus* (Forsskal) (Spangled emperor)

Key to the species

1a. Cheek with 4 to 6 vertical rows of scales; dorsal fin with 10 soft rays; anal fin usually witrh 9 to 10 soft rays 2

1b. Cheek naked; dorsal fin with 9 soft rays; anal fin with 8 soft rays 4

2a. Anal fin usually with 9 soft rays .... *G. aurolineatus*

2b. Anal fin with usually 10 soft rays 3

3a. Caudal fin strongly forked, the median rays shorter than eye diameter; lower margin of eye intersected by line from snout tip to middle of caudal fin ..... *G. elongatus*

3b. Caudal fin somewhat forked, the median rays almost equal to or longer than eye diameter; lower margin of eye above line from snout tip to middle of caudal fin .. *G. grandoculis*

4a. Inner surface of pectoral fin base without scales or with few scales covering less than ½ the inner bases of the fin ..... *L. lentjan*

4b. Most of the inner surface of pectoral fin base covered with scales ..... *L. nebulosus*

Fisheries information : The large eye breams and emperor fishes are of important commercial value and these fishes are usually marketed fresh.

Remarks : Report of *Lethrinus cinereus* (Cuvier & Valenciennes) is referable to *Lethrinus lentjan* (Lacepede) (Carpenter and Allen, 1989).

Family 86 SPARIDAE
(Seabreams)

Body oblong, almost deep and compressed with cycloid or ctenoid scales. Head usually with a steep dorsal profile. Snout without scales but cheeks with scales. Opercle with or without scales. Mouth subhorizontal and slightly protrusible. Maxilla not extending beyond the middle of the orbit. Posterior tip of premaxilla overlapping maxilla. Dorsal fin with 10 to 13 spines.

Species known to occur in Karnataka

1. *Acanthopagrus berda* (Forsskal) (Picnic seabream)
2. *Acanthopagrus bifasciatus* (Forsskål) (Twobar seabream)
3. *Acanthopagrus latus* (Houttuyn) (Yellowfin seabream)
4. *Argyrops spinifer* (Forsskal) (Longspine seabream)
5. *Cheimerius nufar* (Valenciennes) (Santer seabream)
6. *Crenidens crenidens* (Forsskål) (Karenteen seabream)
7. *Rhabdosargus sarba* (Forsskål) (Goldlined seabream)
8. *Sparidentex hasta* (Valenciennes) (Sobaity seabream)

Key to the species

1a. Jaw teeth usually incisiform or caniniform molarlike teeth absent 2

1b. Posterior jaw teeth usually molar-like or granular 4

2a. Outer teeth incisiform, compressed, with crenelated cutting edge ..... *C. crenidens*

2b. Outer teeth caniniform, some enlarged in front of jaws 3

3a. First two dorsal spines short, 3rd to 7th elongated, filamentous ..... *C. nufar*

3b. Dorsal spines normally graduated, not filamentous ..... *S. hasta*

4a. Interorbital space scally, head scaled from above anterior margin of eye; first two dorsal spines very short, following spines elongate ..... *A. spinifer*

4b. Interorbital space naked, head scaled from behind posterior margin of eye; dorsal spines normally graduated, not prolonged 5

5a. More than 5 scales between lateral line and 4th dorsal spine; usually dorsal spines slender, not alternately broad and narrow; a single enlarged molar posteriorly on each side .... *R. sarba*

5b. Less than 5 scales between lateral line and 4th dorsal spine; dorsal spines strong, appearing alternately broad and narrow on each side; no enlarged molar posteriorly on each side 6

6a. Head with two black bars across head, the first through eye and second from nape to opercle to its inferior edge .... *A. bifasciatus*

6b. Head without black cross bars, or at most with a dark band between eyes 7

7a. Six series of preopercular scales; lateral line scales 43 to 45; no silvery margin to scales; no dark spot at origin of lateral line; soft dorsal, anal and caudal fins blackish .... *A. berda*

7b. Four or 5 series of preopercular scales; lateral line scales 48 to 50; scales with dark bases and silvery margins (especially above lateral line); a dark spot at the origin of lateral line; soft dorsal fin grayish hyaline, anal fin whitish and caudal fin yellow ..... *A. latus*

Fisheries information : The sea breams are of much commercial importance. These fishes are marketed fresh and are of excellent and highly esteemed.

Family 87 POLYNEMIDAE
(Threadfins)

Body almost elongate and compressed. Mouth subterminal. Dorsal fins two, well separated from each other, the first with 7 to 8 flexible spines. Anal fin with 2 or 3 spines. Pectoral fins divided into two parts, the upper part normal with branched or unbranched rays, lower part with 3 to 15 free filamentous rays. Pelvic fins with one spine and 5 branched rays, subabdominal in position. Caudal fin deeply forked.

Species known to occur in Karnataka

1. *Eleutheronema tetradactylum* (Shaw) (Fourfinger threadfin)
2. *Filimanus similis* Feltes (Indian sevenfinger threadfin)
3. *Filimanus xanthonema* (Valenciennes) (Yellowthread threadfin)
4. *Leptomelanosoma indicum* (Shaw) (Indian threadfin)
5. *Polydactylus plebeius* (Broussonet) (Striped threadfin)
6. *Polydactylus sextarius* (Bloch & Schneider) (Blackspot threadfin)
7. *Polynemus paradiseus* Linnaeus (Paradise threadfin)

Key to the species

1a. Pectoral fin inserted high, near midline of body; eyes small, eye diameter 1.3 or more in snout length; free pectoral filaments 7 ... . *P. paradiseus*

1b. Pectoral fin inserted low, well below midline, mostly on lower third of body; eyes larger, eye diameter 1.3 or less in snout length; free pectoral filaments 4 to 7 2

2a. Lip on lower jaw absent except at corner of mouth; small teeth extending onto lateral surface of jaws on anterior part; free pectoral filaments 4; gill rakers 6 to 18 on first arch ..... *E. tetradactylum*

2b. Lip on anterior part of lower jaw more or less developed; almost no teeth on exterior part of lower jaw; free pectoral filaments 5 to 7; gill rakers 18 to 55 on first arch 3

3a. Eyes small, about 7 times in head length; tip of caudal fin lobes prolonged; air bladder with several appendages; gill rakers 18 to 21 .... *L. indicum*

3b. Eyes larger, about 4 to 6 times in head length; tip of caudal fin lobes not prolonged; air bladder simple, without appendages; gill rakers 24 to 49 4

4a. Premaxillary teeth bands narrow, separated by a wide space of 2 or more times width of each band at symphysis; gill rakers 36 to 49 on first arch 5

4b. Premaxillary teeth bands broad, separated by a narrow space of less than 2 times width of each band at symphysis; gill rakers 24 to 35 on first arch 6

5a. Free pectoral filaments 7; gill rakers 40 to 49 (mode 43) ..... *F. similis*

5b. Free pectoral filaments usually 6 (rarely 5), or asymmetrically 5 and 6, or 6 or 7; gill rakers 36 to 46 (mode 41) .... *F. xanthonema*

6a. Lateral line with 60 to 68 scales; no black shoulder spot at beginning of lateral line; teeth on vomer present; free pectoral filaments 5; upper pectoral fin rays all unbranched..... ..... *P. plebeius*

6b. Lateral line with 45 to 51 scales; a black shoulder spot at beginning of lateral line; teeth on vomer absent; free pectoral filaments 6; upper pectoral fin rays all branched except for 1 or 2 ..... *P. sextarius*

Fisheries information : These fishes are of important commercial value and well esteemed as food fish. The Indian threadfin fish, *L. indicum* (Shaw), constitute an important fishery.

Remarks : In literature, two different species having 7 free pectoral filaments were referred as *Polydactylus heptadactyla* (Cuvier) from west coast of India, whereas this species does not occur along Indian coast (Barman and Mishra, 2010). The specimens without black shoulder spot and 40 to 47 gill rakers are considered as *F. similis* Feltes. Although there is no material confirmation, those *P. heptadactylus* of Karnataka coast may include another species with a black shoulder spot and 31 to 35 gill rakers, to be referred as *Polydactylus mullani* (Hora), which closely resemble *P. sextarius* but differs in gill raker count and a robust base to second spine of first dorsal fin (Motomura, 2004). Several records pertaining to *Polydactylus sexfilis* are also found to be erroneous and those are referable to *Filimanus xanthonema* (Valenciennes) (Barman and Mishra, 2010). Recently a new generic name, *Leptomelanosoma,* proposed by Motomura and Iwatsuki (2001), is in use for the fish earlier known as *Polydactylus indicus* (Shaw).

Family 88 SCIAENIDAE
(**Croakers**)

Body elongate, moderately compressed with cycloid scales on head and often with ctenoid scales on body. Sensory pores usually conspicuous on tip of snout (rostral pores), on lower margin of snout (marginal pores) and on chin (mental pores). Some species with 1 or 2 mental barbels. Dorsal fin usually long, continuous, with a deep notch between anterior spinous and posterior soft ray parts. The anterior spinous part with 8 to 10 spines (usually 10) and posterior part with 1 spine and 21 to 34 rays. Anal fin with 2 spines, the second spine may be greatly enlarged and strong. Caudal fin emarginated to pointed, but never forked.

Species known to occur in Karnataka

1. *Daysciaena albida* (Cuvier) (Bengal corvine)
2. *Dendrophysa russelli* (Cuvier) (Goatee croaker)
3. *Johnieops borneensis* (Bleeker) (Sharpnose hammer croaker)
4. *Johnieops dussumieri* (Cuvier) (Sin croaker)
5. *Johnieops macrorhinus* Mohan (Big-snout croaker)
6. *Johnieops osseus* (Day) (Greyfin croaker)
7. *Johnius belangerii* (Cuvier) (Belanger's croaker)
8. *Johnius carouna* Bloch (Caroun croaker)
9. *Johnius carutta* Bloch (Karut croaker)
10. *Johnius dussumieri* (Valenciennes) (Bearded croaker)
11. *Johnius elongatus* Mohan (Spindle croaker)
12. *Johnius glaucus* (Day) (Pale spotfin croaker)
13. *Johnius macropterus* (Bleeker) (Largefin croaker)

14. *Kathala axillaris* (Cuvier) (Kathala croaker)
15. *Nibea coibor* (Hamilton) (Coibor croaker)
16. *Nibea maculata* (Bloch & Schneider) (Blotched croaker)
17. *Nibea soldado* (Lacepede) (Soldier croaker)
18. *Otolithes cuvieri* Trewavas (Lesser tigertooth croaker)
19. *Otolithes rubber* (Schneider) (Tiger-toothed croaker)
20. *Panna microdon* (Bleeker) (Panna croaker)
21. *Paranibea semiluctuosa* (Cuvier) (Half-mourning croaker)
22. *Pennahia anea* (Bloch) (Bigeye croaker)
23. *Protonibea diacanthus* (Lacepede) (Spotted croaker)

Key to the species

1a. Gas bladder with one or two pairs of simple or branched appendages 2

1b. Gas bladder with more than two pairs of appendages, almost all arborescent 3

2a. Gas bladder appendages wholly directed forward from anterior end of bladder; a prominent round black spot above pectoral fin axil ..... *K. axillaris*

2b. Gas bladder appendages arising from anterior end of bladder, immediately dividing on each side into a cephalic branch, branching in front of transverse septum of skull, and an abdominal branch, lying parallel to bladder; no prominent black spot at pectoral fin axil ..... *P. microdon*

3a. Gas bladder carrot-shaped 4

3b. Gas bladder hammer-shaped 13

4a. Anterior pair of arborescent appendages of gas bladder branching on posterior surface of transverse septum, but not entering head..... 5

4b. Anterior pair of arborescent appendages of gas bladder extending into head and branching under skull 8

5a. Outer row of teeth in upper jaw enlarged and spaced, but no outstanding canines present; dorsal fin with 21 to 26 soft rays 6

5b. One or two pairs of outstanding canine teeth on both jaws; dorsal fin with 27 to 32 soft rays 7

6a. Pores on chin of 'false five' pattern, first pair close together behind tip of jaw and joined by a groove; scattered small black spots on head, upper part of body and dorsal and caudal fins ..... *P. diacanthus*

6b. First pair of pores small, on front of chin, one on each side of tip of jaw, not joined by a groove; no scattered black spots ..... *P. anea*

7a. Gill rakers 8 to 11 on lower arm of first arch; distance between sphenotic ridge and angle of lower jaw less than length of lower jaw; gas bladder with 30 to 38 pairs of arborescent appendages ..... *O. rubber*

7b. Gill rakers 12 to 17 on lower arm of first arch; distance between sphenotic ridge and angle of lower jaw as long as or longer than length of lower jaw; gas bladder with 25 to 28 pairs of arborescent appendages ..... *O. cuvieri*

8a. Chin with one or two mental barbel (minute, when two) 9

8b. No barbels on chin 10

9a. Chin with two minute barbels; lower jaw teeth well differentiated ..... *D. albida*

9b. Chin with a single barbel; lower jaw teeth uniform ..... *D. russelli*

10a. Lower jaw teeth uniformly small ..... *P. semiluctuosa*

10b. Lower jaw teeth well differentiated in size, lower inner row enlarged 11

11a. A distinct broad oblique blotch on nape followed by 4 broken blotches below dorsal fin and a blotch on caudal fin often present ..... *N. maculata*

11b. No distinct colour pattern or blotches 12

12a. Soft dorsal fin rays 24; deep yellow ventrally in life ..... *N. coibor*

12b. Soft dorsal fin rays 28 to 31; silvery in life ..... *N. soldado*

13a. Outer row of teeth on upper jaw enlarged and widely spaced; lower jaw teeth differentiated in size, the inner lateral row enlarged, conical and spaced; mouth usually subterminal (*Johnieops*) 14

13b. Outer row of teeth on upper jaw enlarged but not spaced; teeth on lower jaw uniform; mouth inferior (*Johnius*) 17

14a. Inner row of lower jaw teeth well developed and spaced; mouth almost terminal; gill rakers 9 to 12 on first arch ... *J. borneensis*

14b. Inner row of lower jaw teeth moderately to slightly enlarged; mouth subterminal to inferior 15

15a. Lower gill rakers 5 to 8 .... *J. macrorhynus*

15b. Lower gill rakers 10 to 15 16

16a. Teeth well differentiated in size in both jaws; gill rakers long and slender .. *J. dussumieri*

16b. Teeth slightly differentiated in size in both jaws; gill rakers short and spinulose .... *J. osseus*

17a. Chin with a mental barbel 18

17b. No mental barbel present 19

18a. Scales on body cycloid; dorsal fin with 22 to 26 soft rays ..... *J. dussumieri*

18b. Scales on body ctenoid; dorsal fin with 30 to 33 soft rays ..... *J. macropterus*

19a. Lateral line with a distinct silvery or yellow streak; interorbital width 8.9 to 9.3 percent of standard length; second anal spine ¼ of head length ..... *J. carutta*

19b. Lateral line without a distinct silvery streak; interorbital width narrower, less than 8.5 percent of standard length; second anal spine $^1/_3$ to ½ of head length 20

20a. Lower gill rakers 6 or 7; mental pores surrounded by thickened skin, produced into two short, barbel-like tags ..... *J. elongatus*

20b. Lower gill rakers 8 to 13; no thickened skin produced into barbel-like tags around mental pores 21

21a. Second spine of anal fin 26 to 36 percent of head length ..... *J. glaucus*

21b. Second spine of anal fin 38 to 58 percent of head length 22

22a. Spinous dorsal fin black; pelvic, anal and caudal fins blackish ..... *J. belangerii*

22b. Spinous dorsal fin light grey; pectoral pelvic, anal and lower part of caudal fin with yellowish tinge ..... *J. carouna*

Fisheries information : These are very important commercial fishes and most common in trawl catches. Large croakers are usually esteemed as good food fishes. The air bladder of croakers is used in preparation of isinglass, a product used in gelatin in confectionaries and for preparation of certain cements.

Remarks : In absence of material confirmation, *Johnieops dorsalis* (Peters) is not included here, but possibilities are more for occurrence of this species along Karnataka coast. Determination of Indian species is mostly based on Mohan (1984), wherein *J. dorsalis* is given as *J. dussumieri.* Hence, the specimens identified as *J. dussumieri* may possibly be *J. dorsalis* which differ from the former in having inflated snout and short, stout, curved and coarsely toothed gill rakers. *Johnieops sina* (Cuvier) is considered as a junior synonym of *Johnieops dussumieri* (Cuvier) (Heemstra, 1986; Sasaki, 1996). *Johnius dussumieri* (Valenciennes) is usually recorded as *Johnius amblycephalus* (Bleeker) as a replacement name when the generic status of *Johnieops* Mohan is not recognized and all *Johnieops* species are placed under genus *Johnius* Bloch. *Johnieops osseus* (Day) is considered here, following De Bruin *et al* (1995), for the species described from Indian coast as *Johnieops aneus,* which is not a

Pennahia species, although authors consider *J. osseus* as a junior synonym of *Johnieops dussumieri* (Cuvier). *Johnius aneus* (Bloch) and *Pennahia macrophthalmus* (Bleeker) has been relegated to synonymy of *Pennahia anea* (Bloch) (Sasaki, 1994). Sasaki (2001) consider *Johnieops vogleri* (Bleeker) as a junior synonym of *Johnieops boeneensis* (Bleeker).

Family 89 MULLIDAE
(Goat fishes)

Body elongate and almost compressed, with ctenoid scales. Chin with 2 long barbels. Mouth inferior, gape slightly diagonal. Eyes situated near dorsal profile on head. Dorsal fin two, well separated, the first with 7 to 8 (generally) slender spines (first spine often very small) and the second with 9 rays (first unbranched). Anal fin with 1 spine and 6 rays. Caudal fin deeply forked, with 13 branched rays.

Species known to occur in Karnataka

1. *Mulloidichthys flavolineatus* (Lacepède) (Yellowstripe goatfish)
2. *Mulloidichthys vanicolensis* (Valenciennes) (Yellowfin goatfish)
3. *Parupeneus barberinus* (Lacepède) (Dash-and-dot goatfish)
4. *Parupeneus cyclostomus* (Lacepède) (Goldsaddle goatfish)
5. *Parupeneus heptacanthus* (Lacepede) (Cinnabar goatfish)
6. *Parupeneus indicus* (Shaw) (Indian goatfish)
7. *Parupeneus macronemus* (Lacepède) (Longbarbel goatfish)
8. *Parupeneus trifasciatus* (Lacepede) (Doublebar goatfish)
9. *Upeneus guttatus* Day (Silverstripe goatfish)
10. *Upeneus molluccensis* (Bleeker) (Goldband goatfish)
11. *Upeneus sulphureus* Cuvier (Sulphur goatfish)
12. *Upeneus sundaicus* (Bleeker) (Ochre-banded goatfish)
13. *Upeneus tragula* Richardson (Freckled goatfish)
14. *Upeneus vittatus* (Forsskal) (Yellowstriped goatfish)

Key to the species

1a. Vomer and palatines toothed; both dorsal fin with stripes; oblique bands on caudal fin lobes often present 2

1b. Vomer and palatines edentulous; stripes sometime present on second dorsal fin only; caudal fin lobes without oblique black bands 7

2a. First dorsal fin with 7 spines, the first spine longest ..... *U. guttatus*

2b. First dorsal fin with 8 spines, the first spine very small 3

3a. Preorbital scales present; 4½ scale rows in space between dorsal fins 4

3b. Preorbital scales absent; 5½ scale rows in space between dorsal fins 5

4a. Caudal fin lobes with 2 to 7 dusky cross bars; a reddish-brown to blackish stripe from snout to middle of caudal fin base; gill rakers 21 to 25 on first arch ..... *U. tragula*

4b. Caudal fin lobes without cross bars; a yellowish-brown stripe from eye to middle of caudal fin base; gill rakers 18 to 22 on first arch ..... *U. sundaicus*

5a. Oblique cross bars on caudal fin lobes absent ..... *U. sulphureus*

5b. Oblique cross bars on caudal fin lobes present 6

6a. Upper lobe of caudal fin with 3 or 4 orange or red bars; no cross bars on lower lobe of caudal fin ..... *U. moluccensis*

6b. Upper lobe of caudal fin with 4 or 5 dark bands; lower lobe of caudal fin with 3 or 4

dark bands, the distal one darkest and broadest ..... *U. vittatus*

7a. Teeth in jaws small, in villiform band anteriorly; 5 scale rows between dorsal fins; 11 or 12 scale rows along upper part of caudal peduncle; lateral line scales 33 to 38 8

7b. Teeth in jaws moderately large, in a single row; 2 or 3 scale rows between dorsal fins; 8 or 9 scale rows along upper part of caudal peduncle; lateral line scales 26 to 31 9

8a. Gill rakers 25 to 30 on first arch; body depth 3.6 to 4.7 in standard length; barbels slightly less than snout plus eye diameter; a black spot often present above pectoral fin in lateral yellow stripe on body ..... *M. flavolineatus*

8b. Gill rakers 32 to 36 on first arch; body depth 3.3 to 3.6 in standard length; barbels longer than snout plus eye diameter; no black spot above pectoral fin in lateral yellow stripe on body ..... *M. vanicolensis*

9a. A dark longitudinal band from snout or eye to below second dorsal fin present; a dark round blotch of not more than 2½ scale diameter on caudal peduncle centered on lateral line 10

9b. No dark longitudinal band as above; dark blotch on caudal peduncle absent, or if present, more than half of the blotch above lateral line and extending over 3 or more scales 11

10a. Last ray of second dorsal fin distinctly longer than penultimate ray; barbels much longer than snout and eye combined; a dark blotch present at middle of caudal peduncle..... ..... *P. macronemus*

10b. Last ray of second dorsal fin not longer than penultimate ray; barbels shorter than snout and eye combined; a dark blotch present close to upper edge of caudal peduncle..... ..... *P. barberinus*

11a. Gill rakers 27 to 30 on lower limb of first arch; black vertical saddle-like vertical bars below each dorsal fin and a faint third bar on caudal peduncle ..... *P. trifasciatus*

11b. Gill rakers 18 to 24 on lower limb of first arch; no vertical bars below dorsal fin, at most one on caudal peduncle 12

12a. Length of barbels less than 1.2 times in head length, reaching to base of pelvic fins; lower gill rakers 21 to 24; a large oblong, golden saddle on upper part of caudal peduncle ... . *P. cyclostomus*

12b. Length of barbels more than 1.2 times in head length, reaching to slightly beyond rear edge of preopercle; lower gill rakers 19 to 21; no golden saddle on caudal peduncle.. 13

13a. A large oval dark blotch of about twice eye diameter on sides of caudal peduncle; a yellow or whitish oblong blotch from below posterior part of first dorsal to anterior part of second dorsal fin ..... *P. indicus*

13b. Dark blotch on caudal peduncle and pale oblong blotch below interdorsal space absent; a small dark rectangular blotch below and behind first dorsal fin often present .... *P. heptacanthus*

Fisheries information : The goat fishes are of high commercial value as they are esteemed as good food fishes and so, are of moderate fisheries importance. *U. sulphureus* is the most common species found on estuaries and coastal waters.

Remarks : Earlier records of *Parupeneus cinnabaricus* (Cuvier) and *Parupeneus bifasciatus* (Lacepede) are relegated to synonymy of *Parupeneus heptacanthus* (Lacepede) and *Parupeneus trifasciatus* (Lacepede) respectively (Randall, 2004). Reports of *Upeneus bensasi* (Temminck & Schlegel) along Indian coast are referable to *Upeneus guttatus* Day (Barman and Mishra, 2007).

Family 90 MONODACTYLIDAE
(Silverbat fish, Moon fish)

Body deep and oval, strongly compressed.

Mouth small, jaws with feeble teeth; vomer and palate with granulated teeth, maxilla exposed. Upper jaw slightly protrusible. Dorsal fin with 7 to 8 spines and 25 to 31 rays. Anal fin with 3 spines and 25 to 30 rays. Pelvic fins rudimentary or absent. Scales fine, cycloid or ctenoid, deciduous; extending on to median fin and head.

Species known to occur in Karnataka

1. *Monodactylus argenteus* (Linnaeus) (Silverbat fish)
2. *Monodactylus falciformes* Richardson (Moonfish)

Key to species

1a. Body depth 1.5 to 2.0 times in standard length; gillrakers 22 to 24 on lower limb of first arch ..... *M. falciformis*

1b. Body depth 1.2 to 1.5 times in standard length; gillrakers 16 to 21 on lower limb of first arch ..... *M. argenteus*

Fisheries information : The silverbat fishes are usually found in the costal waters on the west coast of our country. *M. argenteus* is a very good aquarium fish since it thrives well in captivity.

Family 91 TOXOTIDAE

Body deep and compressed. Mouth large, terminal and highly protrusible. Eyes large. Head flat dorsally and pointed. Dorsal fin placed far back on body, with 4 or 5 spines and 12 to 14 rays. Anal fin with 3 spines and 15 to 17 rays. Soft dorsal fin base considerably shorter than soft anal fin base. Dorsal and anal fins scaly. Lateral line complete, with 25 to 45 scales.

Species known to occur in Karnataka

1. *Toxotes chatereus* (Hamilton) (Spotted archerfish)
2. *Toxotes jaculator* (Pallas) (Banded archerfish)

Key to the species

1a. Dorsal fin with 4 spines; four or five black bars on upper side of body; lateral line scales 26 to 30; scales below lateral line 8 or 9 rows ..... *T. jaculator*

1b. Dorsal fin with 5 spines; five to 7 black blotch on upper side of body; lateral line scales 30 to 34; scales below lateral line 10 or 11 rows ..... *T. chatareus*

Fisheries information : These are of minor commercial importance.

Family 92 KYPHOSIDAE
(Rudderfishes, Sea chubs)

Body oblong to ovate and compressed, with ctenoid scales. Mouth small, horizontal with an almost exposed maxilla; upper jaw slightly protrusible. Dorsal fin with 6 to 12 spines and 11 to 22 rays, depressible in a sheath. Anal fin with 3 spines and 11 to 26 rays. Pectoral fins short. Pelvic fins with one spine and 5 rays and with a scally axillary process. Caudal fin forked or emarginated.

Species known to occur in Karnataka

1. *Kyphosus cinerascens* (Forsskal) (Blue sea chub)

Fisheries information : It is not considered as a good food fish and so, fetches a low price. It is a common fish in coastal waters and near estuaries.

Family 93 DREPANIDAE
(Sicklefishes)

Body highly deep and greatly compressed, with finely ctenoid scales. Head with a parabolic dorsal profile. Mouth terminal and protrusible, forming a downward projecting tube when protracted. Dorsal fin with 8 to 10 spines (the first small, procumbent, visible only in juveniles), the spinous part separated from soft part of dorsal fin by a deep notch and expressible in a high basal scaly sheath. Anal fin with 3 spines. Pectoral fins long and falcate, extending to base of caudal fin. Caudal fin rounded. Lateral line highly arched.

Species known to occur in Karnataka

1. *Drepane punctata* (Linnaeus) (Spotted drepane)

Fisheries information : It is fairly common in trawl catches. Its flesh is considered as of excellent quality and marketed fresh. It contributes to fishery seasonally only.

Family 94 CHAETODONTIDAE
(Butterflyfishes)

Body oval to orbicular or subrhomboid and highly compressed. Mouth small, terminal and protractile; maxilla not extending beyond anterior border of eye. Snout slightly produced to highly elongate. Dorsal fin with 6 to 16 spines and 15 to 31 rays, sometimes with a slight notch between spinous and soft rays. Anal fin with 3 spines (rarely 4) and 14 to 27 rays. Lateral line extending either up to base of soft part of dorsal fin or caudal fin base. An axillary scally process at base of pelvic fin spine.

Species known to occur in Karnataka

1. *Chaetodon collarae* (Bloch) (Redtail Butterfly fish)
2. *Heniocus acuminatus* (Linnaeus) (Pennant coral fish)

Key to the species

1a. Lateral line complete, extending up to caudal fin base; fourth dorsal spine elongate to filamentous, often longer than body depth; two broad black bands, first excluding eye from dorsal fin origin to pelvic fin .... *H. acuminatus*

1b. Lateral line incomplete, extending up to near last rays of dorsal fin; fourth dorsal spine normal, not extended or filamentous; a black ocular band present with a white band behind it ..... *C. collarae*

Fisheries information : The butterfly fishes are of the most colourful among the coral reef fishes. These fishes are used in the aquarium trade.

Family 95 POMACANTHIDAE
(Angelfishes)

Body oval to orbicular and highly compressed with ctenoid scales. Mouth small, terminal, protrusible; maxilla not extending to anterior border of orbit. Preopercle with a strong spine. Dorsal fin with 9 to 15 spines and 15 to 33 rays and highly extending into filaments. Anal fin with 3 spines and 14 to 25 soft rays.

Species known to occur in Karnataka

1. *Apolemichthys xanthurus* (Bennett) (Yellowtail angelfish)
2. *Pomacanthus annularis* (Bloch) (Ringed anglefish)

Key to species

1a. Dorsal and anal fins not prolonged in to a filamentous extension; longest dorsal and anal rays about equal to or shorter than middle caudal fin rays; juveniles similar to adults in colour; soft dorsal rays usually 18 or less... ..... *A. xanthurus*

1b. Dorsal and/or anal fin frequently prolonged into filamentous extensions; longest dorsal (and usually anal) ray longer than middle caudal fin rays; juveniles of different colour than adults, generally black with series of blue or white narrow vertical bands on sides; soft dorsal rays usually 19 or more .... *P. annularis*

Fisheries information : The juveniles of the Angelfishes are popular aquarium fishes. These fishes are of little commercial importance.

Family 96 TERAPONIDAE
(Terapon-perches, terapons)

Body oblong or oblong-ovate, almost compressed. Opercle with one or two spines, preopercle serrate. Dorsal fin with 11 to 14 spines and 8 to 14 rays, almost separated by a deep notch in some species. Anal fin with 3 spines and 7 to 12 rays. Caudal fin rounded, truncate or emarginated. Body usually with longitudinal dark stripes on sides and caudal fin with dark stripes.

Species known to occur in Karnataka

1. *Pelates quadrilineatus* (Bloch) (Fourlined terapon)

2. *Terapon jarbua* (Forsskal) (Jerbua terapon)
3. *Terapon theraps* (Cuvier) (Largescaled terapon)
4. *Terapon puta* (Cuvier) (Smallscaled terapon)

Key to species

1a. Post-temporal covered with skin and scales, not extended posteriorly, not with a serrate edge; gill membranes united with isthmus.. ..... *P. quadrilineatus*

1b. Post-temporal extended and serrate posteriorly, exposed posteriorly, skin and scale covering reduced; gill membranes free from isthmus 2

2a. Lateral line with 46 to 56 scales; 6 to 8 scales above lateral line ..... *T. theraps*

2b. Lateral line with 70 or more scales; 10 to 17 scales above lateral line 3

3a. Three or 4 straight longitudinal stripes present on lateral side of body; gillrakers 18 to 24 on lower arm of first gill arch ..... *T. puta*

3b. Three or 4 curved stripes present on lateral side of body; gill rakers 12 to 15 on lower arm of first arch ..... *T. jarbua*

Fisheries information : The terapons are important commercial food fishes. *T. jarbua* is a very common species and a hardy aquarium fish found in both the coasts of our country.

Remarks : *P. quadrilineatus* is a common species known for its croaking noise it invariably makes when taken out of water. *T. jarbua* is very common in all coastal waters of the country.

Family 97 KUHLIIDAE
(Flagtail)

Body oblong and compressed with ctenoid scales. Upper jaw slightly protrusible, maxilla mostly exposed and without supramaxilla. Opercle with 2 exposed flat spines. Dorsal fin with 10 spines and 9 to 16 rays. Anal fin with 3 spines and 10 to 16 rays. Pelvic fins with 1 spine and 5 rays. Caudal fin emarginated or forked.

Species known to occur in Karnataka

1. *Kuhlia mugil* (Schneider) (Barred flagtail)
2. *K. rupestris* (Lacepede) (Rock flagtail)

Key to species

1a. Caudal fin with 5 prominent dark bands; lateral line scales 48 to 53; gillrakers 10 to 12 on upper limb and 23 to 26 on lower limb of first arch ..... *K. mugil*

1b. Caudal fin without dark bands, but juveniles with a blackish blotch on each lobe forming a broad submarginal black band in adults; lateral line scales 38 to 43; gillrakers 6 to 7 on upper limb and 16 to 18 on lower limb of first arch ..... *K. rupestris*

Fisheries information : The flagtail fishes are important food fishes. These fishes are generally used as bait for large fishes.

Family 98 CICHLIDAE
(Cichlids)

Body deep and compressed. Single nostril on each side of snout. Jaws toothed; palatine and vomer edentulous. Dorsal fin with 12 to 22 spines and 8 to 23 soft rays; anal fin with 3 to 16 spines and 6 to 24 soft rays. Scales weakly ctenoid. Lateral line interrupted, usually with 30 to 40 scales.

Species known to occur in Karnataka

1. *Oreochromis mossambicus* (Peters) (Tilapia)
2. *Etroplus suratensis* (Bloch) (Banded Pearlspot)
3. *Etroplus maculatus* (Bloch) (Spotted chromide)
4. *Etroplus canarensis* Day (Canara pearlspot)

Key to the species

1a. Anal fin with 3 or 4 spines; scales cycloid, rarely indistinctly ctenoid .... *O. mossambicus*

1b. Anal fin with 12 to 15 spines; scales slightly ctenoid 2

2a. Body with 1 to 3 dark circular blotches along sides; dorsal fin with 8 to 10 soft rays and anal fin with 8 or 9 soft rays .... *E. maculatus*

2b. Body with vertical bands on sides with small white pearly spots 3

3a. Dorsal fin with 18 to 19 spines and 14 or 15 soft rays; anal fin with 11 or 12 soft rays . ..... *E. suratensis*

3b. Dorsal fin with 21 to 22 spines and 8 soft rays; anal fin with 6 to 7 soft rays .... *E. canarensis*

Fisheries information : The cichlids are very common in brackish waters and attain a length of 40 cm. These fishes are excellent delicious fishes and are also used in aquaculture and in aquaria.

Family 99 LABRIDAE
(Tuskfishes, Hogfishes)

Body almost compressed and oblong. Mouth terminal, generally with conspicuous lips. Jaws slightly to extremely protrusible. Dorsal fin with generally 8 to 21 spines and 7 to 14 soft rays. Anal fin with 3 spines and 7 to 18 rays. Lateral line smoothly curved, complete or interrupted.

Species known to occur in Karnataka

1. *Halichoeres marginatus* Ruppell (Dusky wrasse)

Fisheries information : Labrids are usually too small to have any commercial value, but larger ones are good as food fish. Dusky wrasse is known to grow maximum 18 cm total length.

Remarks : This fish has been reported as *Platyglossus notopsis* (Valenciennes).

Family 100 SCARIDAE
(Parrotfishes)

Body oblong, almost compressed. Head usually bluntly rounded anteriorly. Mouth small, with jaws fused into a beak-like dental plates. Some species with posterior canine teeth. Dorsal fin with 9 spines and 10 to 11 rays. Anal fin with 3 spines and 9 rays. Pelvic fins with one spine and 5 rays. Caudal fin rounded in juvenile specimens but lobes usually extended in adults. Lateral line interrupted below posterior margin of dorsal fin, with 22 to 24 cycloid scales.

Species known to occur in Karnataka

1. *Scarus ghobban* Forsskal (Blue-barred parrotfish)
2. *Scarus russellii* Valenciennes (Eclipse parrotfish)

Key to the species

1a. Median predorsal scales usually 5 or 6 (often 6); cheek scales in 3 rows ..... *S. ghobban*

1b. Median predorsal scales usually 4; cheek scales in 2 or 3 rows..... *S. russelii*

Fisheries information : The parrot fishes are of little commercial importance. These fishes form one of the prominent groups of coral reef fishes associated with artisanal fisheries.

Family 101 PINGUIPEDIDAE
(Sandmelts, Sandperches)

Body elongate, subcylindrical and posteriorly compressed. Mouth large. Opercle with one stout spine. Dorsal fin with 4 to 5 spines and 19 to 24 rays, the last spine attched by a membrane to the first soft ray. Anal fin with one weak spine and 16 to 19 branched soft rays. Pelvic fins with one short spine concealed in the skin and 5 rays. Caudal fin rounded or truncate to emarginated. Body with ctenoid scales but opercle and cheek with cycloid scales.

Species known to occur in Karnataka

1. *Parapercis hexophthalma* (Cuvier) (Spotted sandmelt)

Fisheries information : The sandperches are of little commercial importance. These fishes are sometimes found in the bottom trawls.

Remarks : This family was earlier known as Mugiloididae.

Family 102 CALLIONYMIDAE
(Dragonnets)

Body elongate and more or less compressed. Jaws with villiform teeth and upper jaw very protrusible. Preopercle armed with stout spine. Gill openings restricted to a small dorsal or sublateral pores. Eyes generally directed upwards. Dorsal fin two, the first with 4 flexible spines and the second with 7 to 11 rays. Anal fin with 6 to 12 rays. Pelvic fins with one spine and 5 rays, jugular in position, well separated from each other. Body without scales. Lateral line consisting of pores.

Species known to occur in Karnataka

1. ? *Callionymus japonicus* Houttuyn

Fisheries information : Dragonets are not considered as of any commercial value.

Remarks : Occurrence of this particular fish along Indian coast needs further confirmation as authors feel that Indian Ocean records are outside normal distributional range. More possibly, it is some other species with long pointed caudal fin.

Family 103 ELEOTRIDAE
(Sleepers)

Body elongate with ctenoid or cycloid scales, sometimes partially or completely naked. Dorsal fin two, the first with 6 flexible spines and the second with 1 spine and 8 to 19 rays. Anal fin with one spine and 6 to 19 rays. Pelvic fins separated with sucking disc, bases close together or united, with one spine and 5 rays. Caudal fin with 15 or 17 rays. Lateral line absent.

Species known to occur in Karnataka

1. *Butis butis* (Hamilton) (Duckbill sleeper)
2. *Bunaka gyrinoides* (Bleeker) (Greenback gauvina)
3. *Eleotris fusca* (Schneider) (Dusky sleeper)
4. *Ophiocara porocephala* (Valenciennes) (Northern mud gudgeon)

Key to the species

1a. Scales moderate, lateral series scales 28 to 40; predorsal scales about 40 or more 2

1b. Scales small, lateral series scales 55 to 70; predorsal scales less than 30.....3

2a. Bony ridge present above eye; scales on lateral series about 30 ..... *B. butis*

2b. No bony ridge above eye; scales on lateral series about 38 to 40..... *O. porocephala*

3a. Angle of preopercle with a single ventrally dirested spine; predorsal scales about 20; longitudinal mucous canals in two rows over cheek, crossed by canals radiating under eye ..... *E. fusca*

3b. Angle of preopercle without spines; predorsal scales 24 to 26; only two longitudinal rows of mucous canals over cheek, not crossed by radiating canals under eye..... *B. gyrinoides*

Fisheries information : These are of no fishery importance.

Family 104 GOBIIDAE
(Gobias)

Body elongate or oval and compressed, with ctenoid or cycloid scales. Head with or without pores, but typically having sensory pore canals. Dorsal fin usually two, spinous dorsal fin when present, separated from soft dorsal fin and with 2 to 17 spines. The second or soft rayed dorsal fin and the anal fins are similar in shape and size. Pelvic fins united, sometimes entirely or posteriorly incised, usually forming an adhesive or sucking disc.

Species known to occur in Karnataka

1. *Glossogobius giuris* (Hamilton) (Tank goby)
2. *Oxyurichthys microlepis* (Bleeker) (Maned goby)
3. *Oxyurichthys tentacularis* (Valenciennes) (Tentacled goby)
4. *Psammogobius biocellatus* (Valenciennes) (Sleepy goby)
5. *Sicyopterus griseus* (Day)
6. *Stenogobius gymnopomus* (Bleeker)

7. *Trypauchen vagina* (Bloch & Schneider) (Burrowing goby)
8. *Yongeichthys criniger* (Valenciennes)

Key to the species

1a. Body eel-like; a pauch-like cavity behind operculum ..... *T. vagina*

1b. Body elongate to oblong; no cavity behind operculum 2

2a. Lower jaw with single row of teeth; lateral series with about 80 scales ..... *S. griseus*

2b. Lower jaw with several rows of teeth; lateral series with less than 70 scales 3

3a. Inner edge of shoulder girdle with some fleshy flsps ..... *S. gymnopomus*

3b. Inner edge of shoulder girdle smooth or with minute bumps only 4

4a. Teeth on upper jaw in one row; a membranous crest on nape 5

4b. Teeth on upper jaw in several rows; no dermal crest on nape 6

5a. Distinct elongate tentacle over eye; first dorsal fin with 3 rows of reddish-violet spots; 2nd dorsal fin 5 or 6 rows of oblong reddish-violet spots ..... *O. tentacularis*

5b. No tentacle, but often a bump over eye; first dorsal fin with two blue lines; 2nd dorsal fin with blue spots ..... *O. microlepis*

6a. Gill opening restricted to pectoral fin base or slightly below; predorsal scales 2 or 3; three larger blackish spots along sides .... *Y. criniger*

6b. Gill opening extending below rear margin of preopercle or beyond; predorsal scales 12 to 20; no larger spots along sides 7

7a. Branchiostegal membranes form a free fold across isthmus; iris with a lappet dorsally covering part of pupil; body dark with many longitudinal lines and saddles on back .... *P. biocellatus*

7b. Branchiostegal membranes attached to sides of isthmus; iris without a lappet dorsally; body pale, without longitudinal lines or saddles on back ..... *G. giuris*

Fisheries information : These fishes are of no fishery significance. But *G. giuris* is marketed fresh.

Remarks : *Stenogobius malabaricus* (Day) is relegated to synonymy of *Stenogobius gymnopomus* (Bleeker) (Talwar and Jhingran, 1991).

Family 105 EPHIPPIDAE
(Spadefishes)

Body greatly deep to more or less orbicular and highly compressed with scales. Head short, its profile either steep or considerably convex. Mouth small, horizontal; tip of maxilla concealed. Dorsal fin with 9 spines, interspinous membranes deeply incised, sometimes filamentous; spinous part separated from soft part by a deep notch. Anal fin with 3 spines. Pectoral fins short and rounded. Pelvic fins thoracic, pointed, with an axillary process. Caudal fin distally almost sigmoid shaped, with an obtuse median angular process. Body with 4 or 5 vertical black bands which fade with the maturity of the fish.

Species known to occur in Karnataka

1. *Ephippus orbis* (Bloch) (Orbfish)
2. *Platax orbicularis* (Forsskal) (Orbicular batfish)
3. *Platax teira* (Forsskal) (Tiera batfish)

Key to the species

1a. Spinous dorsal fin separated from soft rayed portion by a deep notch, spines in dorsal not increasing in length posteriorly..... *E. orbis*

1b. Spinous dorsal fin united with soft rayed portion, without notch, spines in dorsal increasing in length posteriorly 2

2a. Dorsal finrays 28 to 34; soft dorsal and anal fins greately elongated; mouth profile

rounded; scales small, 40 to 45 from lateral line origin to 1st dorsal spine ..... *P. teira*

2b. Dorsal finrays 35 to 37; soft dorsal and anal fins not much elongated; mouth profile pointed; scales larger, 25 to 30 from lateral line origin to 1st dorsal spine .... *P. orbicularis*

Fisheries information : The batfishes are of not much commercial importance. These fishes are edible and palatable but not much esteemed as food on account of their foul feeding habits.

Remarks : Several records of Indian coast are referred to *Platax pinnatus* (Linnaeus), a species not likely to occur in this region. This species usually differs from *P. orbicularis* in having only 3 or 4 mandibular pores on each side (vs 5 pores) and snout concave before eyes (vs convex in *orbicularis*) (Smith, 1986).

Family 106 SCATOPHAGIDAE
(Scats)

Body quadrangular and greatly compressed. Head profile steep. Mouth small, horizontal with brush-like teeth. Dorsal fin with 11 to 12 strong spines and 16 to 18 rays, the first spine procumbent; middle of dorsal fin with a deep notch. Anal fin with 4 strong spines and 13 to 16 rays. Pectoral fins, relatively small, with 16 to 17 rays. Caudal fin truncate or slightly emarginate. Lateral line arched and complete. Body silvery or greenish with numerous dark spots.

Species known to occur in Karnataka

1. *Scatophagus argus* (Bloch) (Spotted scat)

Fisheries information : The scats are of not much commercial importance. These fishes are popular aquarium fishes due to their attractiveness for their colour pattern of dark spots or bars on their body and orange-red colour on the dorsal profile.

Family 107 SIGANIDAE
(Parrotfishes)

Body oblong or oval, almost compressed. Head usually bluntly rounded anteriorly. Mouth small, jaws with a single row of fine, close-set teeth. Dorsal fin with 13 strong spines and 10 rays. Anal fin with 7 spines and 9 rays. Pelvic fins with two spines and 3 rays. Dorsal fin preceeded by a forward projectinf spine. Caudal fin usually emarginate. Scales small, cycloid.

Species known to occur in Karnataka

1. *Siganus canaliculatus* (Park) (Whitespotted spinefoot)
2. *Siganus javus* (Park) (Streaked spinefoot)
3. *Siganus vermiculatus* (Valenciennes) (Vermiculated spinefoot)

Key to the species

1a. Body depth 2.4 to 2.8 times in standard length ..... *S. canaliculatus*

1b. Body depth 1.8 to 2.3 times in standard length 2

2a. Scale rows between mid-dorsal fin base and lateral line 30 to 35 ..... *S. javus*

2b. Scale rows between mid-drosal fin base and lateral line 17 to 28 ..... *S. vermiculatus*

Fisheries information : The rabbitfishes are generally found in the reef areas and among inshore commercial fishes of our country.

Remarks : *Siganus canaliculatus* (Park) has been reported as *Siganus oramin* (Bloch & Schneider). The siganids are commonly known as rabbitfishes owing to their similarity with the mouth of rabbits. Spines of rabbit fishes with grooves on sides are known to contain venom glands. These fishes should be carefully handled otherwise a slightest contact with one of these spine tips may produce a very painful puncture wound.

Family 108 ACANTHURIDAE
(Surgeon fishes)

Body almost elongate or deep, compressed with a single folding lancet-like spine or one or two body plates generally bearing sharp keels on sides of caudal peduncle. Mouth small, teeth in a single

row,variable in shape with genus, but never caniniform or molariform. Dorsal fin with 4 to 9 spines and 19 to 31 soft rays. Anal fin with 2 to 3 spines and 19 to 36 soft rays. Pelvic fins with one spine and 3 to 5 soft rays. Caudal fin lunate or truncate.

Species known to occur in Karnataka

1. *Acanthurus mata* Cuvier (Elongate surgeonfish)

Fisheries information : Surgeon fishes are of little commercial importance.

Remarks : This fish has been reported as *Acanthurus bleekeri* Gunther.

Family 109 SPHYRAENIDAE
(Barracudas)

Body elongate with long pointed snout. Mouth large with lower jaw projecting beyond upper, with large fang-like teeth. Dorsal fin two, considerably separated, the first with 5 spines and second with one spine and 9 rays. Pectoral fins inserted low on body. Caudal fin forked.

Species known to occur in Karnataka

1. *Sphyraena acutipinnis* Day (Sharp-fin barracuda)
2. *Sphyraena barracuda* (Edwards) (Great barracuda)
3. *Sphyraena forsteri* Cuvier (Bigeye barracuda)
4. *Sphyraena jello* Cuvier (Picklhandle barracuda)
5. *Sphyraena obtusata* Cuvier (Obtuse barracuda)

Key to the species

1a. First gill arch with platelets, each bearing several small spines; no gillrakers on first arch; a well defined dusky blotch underneath base of pectoral fins ..... *S. forsteri*

1b. First gill arch without spine-covered platelets as above; either 1 or 2 (rarely 3) gill rakers or none on first arch 2

2a. Gillrakers present on first arch 3

2b. Gillrakers absent on first arch 4

3a. Single gillraker at angle of first arch .... *S. acccutipinnis*

3b. Two (rarely 3) gillrakers at angle of first arch ..... *S. obtusata*

4a. Lateral line pores less than 100 (usually 80 to 90); sides with several inky blotches beneath lateral line..... *S. barracuda*

4b. Lateral line pores more than 100; no black blotches on lower sides of body..... *S. jello*

Fisheries information : The barracudas are of minor commercial importance. These fishes are marketed fresh, frozen dried, salted or smoked.

Family 110 GEMPYLIDAE
(Snake mackerel)

Body elongate and compressed or semifusiform. Mouth large with strong teeth in jaws, those at front of upper jaw generally fang-like. Two nostrils on each side of snout. Dorsal fin two, base of second dorsal fin (excluding finlets) shorter than the first. Pelvic fins usually small, often reduced to a single spine with only a few or without soft rays, or entirely absent in adults. Anal fin like second dorsal fin, with 1 to 2 free or comprised spines. Caudal fin forked, the rays attached only to distal border of hypurals. Lateral line single or double. Caudal peduncle without keels. Scales variously modified or absent.

Species known to occur in Karnataka

1. *Gempylus serpens* Cuvier (Snake mackerel)
2. *Nealotus tripes* Johnson (Black snake mackerel)
3. *Neopinnula orientalis* (Gillchrist & von Bonde) (Sackfish)
4. *Promethichthys prometheus* (Cuvier) (Roudi escolar)
5. *Rexea bengalensis* (Alcock) (Bengal escolar)

6. *?Rexea prometheoides* (Bleeker) (Royal escolar)

Key to the species

1a. Pelvic fins well developed ..... *N. orientalis*

1b. Pelvic fins undeveloped 2

2a. Lateral line single 3

2b. Lateral line double 4

3a. Two free anal spines posterior to vent, first of them large, dagger-shaped; lateral line fairly straight: dorsal fin spines 20 to 21 ... . *N. tripes*

3b. No free anal fin spines posterior to vent; lateral line curved abruptly downward anterilrly; dorsal spines 17 to 18 .... *P. prometheus*

4a. Both lateral line originates at one point at upper edge of opercle; five to seven finlets behind dorsal and anal fins..... *G. serpens*

4b. Lower lateral line originates below fourth to sixth dorsal spine; two to three finlets behind dorsal and anal fins 5

5a. Pectoral fin length 2.2 to 2.4 times in head length; a lancet-shaped stripe of scales extending forward from caudal peduncle to below first dorsal fin base .... *R. prometheoides*

5b. Pectoral fin length 1.6 to 2.0 times in head length; entire body scaleless ....*R. bengalensis*

Fisheries information : These fishes are of minor commercial value.

Remarks : Although Nakamuara and Parin (1993) does not consider possibility of occurrence of *Rexea prometheoides* along Indian coast, it is included here for Nakamura (1984) indicated its availability along west coast of India which need further confirmation.

Family 111 TRICHIURIDAE
(Ribbonfishes)

Body very elongate, compressed, ribbon-like with a small forked or hair-like caudal fin. Mouth large, with strong teeth in jaws; those at front of upper jaw fang-like. A single dorsal fin, extending almost the entire length of body, the spinous part either short and continuous with a very short soft part, or the spinous part somewhat long and separated from soft part by a notch. Anal fin preceded by 2 free spines posterior to anus (first inconspicuous and second variously enlarged as leaf-like or keeled scutes, or as a stout spine), without or reduced soft rays. Pelvic fins absent, or reduced to one scale-like spine and 0 to 2 rudimentary soft rays. Pectoral fins rather small. Lateral line single. Body without scales.

Species known to occur in Karnataka

1. *Eupleurogrammus glossodon* (Bleeker) (Longtooth hairtail)
2. *Eupleurogrammus muticus* (Gray) (Smallhead hairtail)
3. *Lepturacanthus savala* Cuvier (Savalani hairtail)
4. *Trichiurus auriga* Klunzinger (Pearly hairtail)
5. *Trichiurus lepturus* Linnaeus (Largehead hairtail)

Key to the species

1a. Pelvic fins scale-like; free margin of subopercle convex 2

1b. Pelvic fins absent; free margin of subopercle concave 3

2a. A pair of fangs on tips of lower jaw; dorsal fin membrane slightly tinged with black along spines; dorsal side of posterior part of body slightly black; a black spot just behind dermal process of lower jaw; pelvic fins inserted below 11th to 14th dorsal fin rays .... *E. glossodon*

2b. No fangs on tip of lower jaw; dorsal fin membrane pale; both dorsal and ventral sides of posterior part of body black; no black spot behind dermal process of ventral side of lower jaw; pelvic fins inserted below 15th to 18th dorsal fin rays ..... *E. muticus*

3a. First anal fin spine large, its length half of eye diameter; soft anal fin rays pungent spinules breaking through vertical skin; two small canine teeth on upper jaw project forward; a small slit on ventral side of lower jaw for receiving anteriormost fang of upper jaw ..... *L. savala*

3b. First anal fin spine small, its length less than pupil of eye; soft anal fin rays slightly breaking through ventral skin in smaller specimens; no canine teeth on upper jaw project forward; no slit on ventral side of lower jaw 4

4a. Fangs on jaws with barbs; dorsal fin elements more than 130 ..... *T. lepturus*

4b. Fangs on jaws without barbs; dorsal fin elements less than 120 ..... *T. auriga*

Fisheries information : The ribbonfishes form one of the commercial fisheries particularly in Kerala, Andhra Pradesh and Tamil Nadu. These fishes are of poor quality food fishes and are sold dried-salted in some parts of the country.

Family 112 SCOMBRIDAE
(Mackerels and Tunas)

Body torpedo-like strongly built with generally metallic blue or blue green back. Dorsal fin two (depressible into groove) with finlets posterior to seond dorsal fin and anal fin in some species. Lateral line simple or branched. Caudal fin rays deeply divided covering completely the hypural plate. Caudal peduncle slender with a pair of oblique keels close to the end of caudal fin. Body uniformly covered with small cycloid scales or restricted to a corselet around anterior part of body.

Species known to occur in Karnataka

1. *Acanthocybium solandri* (Cuvier) (Wahoo)
2. *Auxis rochei* (Risso) (Bullet tuna)
3. *Auxis thazard* (Lacepede) (Frigate tuna)
4. *Euthynnus affinis* (Cantor) (Kawakawa)
5. *Gymnosarda unicolor* (Rüppell) (Dogtooth tuna)
6. *Katswonus pelamis* (Linnaeus) (Skipjack tuna)
7. *Rastrelliger kanagurta* (Cuvier) (Indian mackerel)
8. *Sarda orientalis* (Temminck & Schlegel) (Striped bonito)
9. *Scomberomorus commerson* (Lacepede) (Narrow-barred Spanish mackerel)
10. *Scomberomorus guttatus* (Bloch & Schneider) (Indo-Pacific king mackerel)
11. *Scomberomorus koreanus* (Kishinouye) (Korean seerfish)
12. *Scomberomorus lineatus* (Cuvier) (Streaked seerfish)
13. *Thunnus albacore* (Bonnaterre) (Yellowfin tuna)
14. *Thunnus tonggol* (Bleeker) (Longtail tuna)

Key to the species

1a. Teeth in jaws strong, compressed, triangular or knife-like 2

1b. Teeth in jaws, slender, conical, or very small 6

2a. Dorsal fin with 23 to 27 spines; gill rakers absent; snout as long as rest of the head (*Acanthocybium*) ..... *A. solandri*

2b. Dorsal fin with 14 to 22 spines; at least 3 gill rakers present; snout shorter than rest of the head (*Scomberomorus*) 3

3a. Lateral line abruptly curving downwards below second dorsal fin; numerous wavy vertical bars on sides below ..... *S. commerson*

3b. Lateral line straight or gradually descending posteriorly; no vertical bars on sides, but with spots or lines 4

4a. Lateral line without fine branches anteriorly; sides of body with narrow horizontal lines, sometimes breaking into spots ventrally ..... *S. lineolatus*

4b. Lateral line with many fine branches

anteriorly; sides of body with round spots. 5

5a. Body depth before second dorsal fin equal to or less than head length; intestine with 2 folds; first dorsal fin black up to 8th spine, white posteriorly ..... *S. guttatus*

5b. Body depth before second dorsal fin greater than head length; intestine with 4 folds; first dorsal fin uniformly black ..... *S. koreanus*

6a. First and second dorsal fin widely separated by a space almost equal to first dorsal fin base 7

6b. First and second dorsal fin almost contiguous or at most separated by a space about eye diameter only 9

7a. Two small keels on either side of caudal peduncle; 5 finlets to dorsal and anal fin each; two horizontal rows of spots below dorsal fin and often with narrow dark longitudinal lines on upper part of body ... *R. kanagurta*

7b. Two small keels and a midlateral keel on sides of caudal peduncle; 7 to 8 finlets to anal and dorsal fin; colour pattern not as above (*Auxis*) 7

8a. Posterior part of corselet narrower, not more than 5 scales wide under second dorsal fin origin; pectoral fins reaching vertical from scaleless area above corselet; dark stripes on back narrow, oblique to nearly horizontal and wavy ..... *A. thazard*

8b. Posterior part of corselet wider, 6 to 20 scales wide under the second dorsal in origin; pectoral fins not reaching vertical from scaleless area above corselet; dark stripes on back broad and nearly vertical .... *A. rochei*

9a. Upper surface of tongue without longitudinal cartilaginous ridge 10

9b. Upper surface of tongue with two longitudinal cartilaginous ridges 11

10a. First dorsal fin with 17 to 19 spines; tongue without tooth patches; 5 to 10 narrow, dark, longitudinal stripes on upper part of body (*Sarda*) ..... *S. orientalis*

10b. First dorsal fin with 13 to 15 spines; tongue with two patches of teeth; no stripes or lines on upper part of body (*Gymnosarda*) ..... *G. unicolor*

11a. Body covered with very small scales behind corselet; pectoral fin with 30 to 36 rays; no black stripes or spots on body (*Thunnus*) 12

11b. Body without scales except for corselet and lateral line; pectoral fin with 26 or 27 rays; dark stripes or bands present on body 13

12a. Gill rakers 26 to 34 on first arch; airbladder present; belly with pale markings arranged in vertical rows ..... *T. albacares*

12b. Gill rakers 19 to 26 on first arch; airbladder absent; belly with pale oval spots arranged in longitudinal rows ..... *T. tonggol*

13a. First dorsal fin with 14 to 16 spines; gill rakers 53 to 63 on first arch; 4 to 6 distinct dark longitudinal stripes on body below lateral line; no spots between pelvic and pectoral fins (*Katsuwonus*) ..... *K. pelamis*

13b. First dorsal fin with 11 to 14 spines; gill rakers 29 to 34 on first arch; oblique stripes above lateral line, but no longitudinal stripes below it; characteristic dark spots between pelvic and pectoral fins (*Euthynnus*) ..... *E. affinis*

Fisheries information : These are important components of commercial pelagic fishery. Flesh of these fishes is mostly oily, rich and tasty. Kerala coast and Lakshadweep islands are most prominent areas for tuna catch and Karnataka being an adjacent state contributes considerably. *K. pelamis* is the most common tuna occurring in this region.

Remarks : Occurrence of the Yellowfin tuna, *Thunnus albacares* (Bonnaterre), along Karnataka coast is doubtful since it is an open water Oceanic fish.

Family 113 XIPHIIDAE
(Swordfishes)

Body elongate and cylindrical without scales in adults but scales with spines present in specimens of almost one meter total length. Upper jaw enlarged into a long bill (both jaws enlarged into long bills in juveniles). Dorsal fin two, well separated in adults (but united in juveniles), first with 34 to 49 and second with 4 to 6 rays. Anal fin two, separated in adults (but united in juveniles), first anal fin with 13 to 14 and second anal fin with 3 to 4 rays. Pectoral fins falcate with 16 to 18 rays. Pelvic fins and pelvic girdles absent. Caudal fin large and lunate. Caudal peduncle with a single median keel on each side and a deep notch on both the dorsal and ventral surfaces.

Species known to occur in Karnataka

1. *Xiphias gladius* Linnaeus (Swordfish)

Fisheries information : The liver oil of the Swordfish contains vitamin A. Its flesh is greatly esteemed.

Remarks : This has been reported from Karnataka coast as *Histiophorus gladius* (Broussonet).

Family 114 ISTIOPHORIDAE
(Sailfishes, Marlins)

Body elongate and cylindrical with ossified and elongate scales, each with one to several points. Premaxillaries prolonged forming a long bill. Dorsal fin two, close together, the first much larger than second. Anal fin two, separated, the first longer than the second. The dorsal fin and anal fins can be folded into groove. Pectoral fins falcate, inserted low on lateral sides of body. Pelvic fins with 1 spine and 2 rays fused together, depressible into a groove. Caudal fin large and forked. Caudal peduncle with a pair of keels on each side and a shallow notch on the both dorsal and ventral surfaces.

Species known to occur in Karnataka

1. *Istiophorus platypterus* (Shaw & Nodder) (Indo-Pacific sailfish)
2. *Makaria indica* (Cuvier) (Black marlin)
3. ?*Tetrapterus angustirostris* Tanaka (Shortbill spearfish)
4. *Tetrapterus audax* (Philippi) (Striped marlin)

Key to the species

1a. First dorsal fin sail-like and considerably higher than body depth at the level of middle of body; pelvic fins very long, almost reaching to origin of anal fin, with conspicuous membrane ..... *I. platypterus*

1b. First dorsal fin slightly higher or lower than body depth at level of middle of body and not sail-like; pelvic fin rays short, considerably separated from origin of anal fin with moderately developed membrane 2

2a. Height of anterior lobe of first dorsal fin lower than body depth; nape greatly elevated; body not compressed laterally ..... *M. indica*

2b. Height of anterior lobe of first dorsal fin slightly higher than or almost equal to body depth; nape slightly elevated or not elevated; body considerably compressed 3

3a. Upper jaw long, less than 1.5 in head length; first dorsal fin low posteriorly; anus close to origin of first anal fin; pectoral fins long, larger than pelvic fins .... *T. audax*

3b. Upper jaw short, about 1.6 in head length; first dorsal fin rather high throughout; anus apart from origin of first anal fin; pectoral fin shorter than pelvic fin .... *T. angustirostris*

Fisheries information : Indo-Pacific sailfish is the most common species along the coasts of our country. The liver oil of these fishes is probably the richest of all containing vitamin A.

Remarks : *Makaria indica* (Cuvier) has been reported as *Tetrapturus brevirostris* (Playfair).

Family 115 CENTROLOPHIDAE

Body somewhat compressed, slender to deep.

Preopercular margin moderately denticulate. Opercle thin, with 2 flat, weak spines. Branchiostagal rays 7. Mouth large, maxilla extends to below eye. Teeth in jaws small, conical and in single series. Vomer and palatines toothless. Pharyngeal sacs with irregularly shaped papillae in 10 or 20 longitudinal bands. Dorsal fin single, continuous, with 0 to 5 weak spines or 5 to 9 short, stout spines. Anal fin with 3 spines and 15 to 41 rays. Scales usually cycloid and easily detached.

Species known to occur in Karnataka

1. *Psenopsis cyanea* (Alcock) (Indian ruff)

Fisheries information : It is of minor fishery importance. Usually taken with bottom trawl in deep water and marketed fresh. The soft flesh of this fish, although tasts good, spoils quickly. Abundant during November to April.

Family 116 ARIOMMATIDAE
(Driftfishes)

Body oval and almost deep, compressed with cycloid and easily detachable scales. Mouth small with minute teeth in jaws. Dorsal fin two, first with 10 to 13 spines and second with one spine and 14 to 18 rays. Anal fin with 3 spines and 13 to 16 rays. Pectoral fins with 20 to 24 rays. Pelvic fins thoracic, attached to the abdomen with a membrane and folding into a long pronounced groove. Caudal fin stiff and deeply forked. Caudal peduncle with 2 low fleshy keels on each side.

Species known to occur in Karnataka

1. *Ariomma indica* (Day) (Indian arioma)

Fisheries information : The driftfishes are of limited commercial importance. These fishes are captured off Kerala, Andhra Pradesh and Tamil Nadu. These fishes contain high quality flesh.

Family 117 STROMATEIDAE
(Pomfrets)

Body very deep and compressed. Mouth small with immovable maxilla. Eyes with adipose eyelid. Single dorsal fin and anal fins, long-based and slightly to deeply falcate, preceded by none or 5 to 10 flat, blade-like spines (mostly in juveniles). Pectoral fins long and wing-like. Pelvic fins absent. Caudal fin generally forked.

Species known to occur in Karnataka

1. *Pampus argenteus* (Euphrasen) (Silver pomfret)
2. *P. chinensis* (Euphrasen) (Chinese pomfret)

Key to species

1a. Dorsal and anal fins falcate, proceeded by 5 to 10 flat, blade-like spines; caudal fin deeply forked ..... *P. argenteus*

1b. Dorsal and anal fins not falcate but fin rays gradually diminish in length posteriorly, no spines preceding the median fins; caudal fin emarginate ..... *P. chinesis*

Fisheries information : Silver pomfret is one of the very important commercial fishes. It has a great demand and marketed fresh.

Order XXIX PLEURONECTIFORMES

Body highly compressed and typically not bilaterally symmetrical; characteristically one eye migrate to the other side of the cranium. Eyes usually protrude above body surface. Eyes lie either on right side (sinistral) or on left side (dextral). Dorsal and anal fins with long bases. Branchiostegal rays 6 to 8. Body cavity small. Scales cycloid, ctenoid, or tuberculate. Eyed side usually coloured, blind side normally white and flat. These are usually benthic and carnivorous.

Key to the families

1a. Dorsal fin with spinous rays, its origin considerably posterior to eyes ..... PSETTODIDAE

1b. Dorsal fin with soft rays only, its origin above or anterior to lower eyes 2

2a. Preopercular margin not free, concealed under the skin or scales 3

2b. Preopercular margin free and visible, not concealed by skin or scales 4

3a. Eyes on right side of head ..... SOLEIDAE

3b. Eyes on left side of head .... CYNOGLOSSIDAE

4a. Pelvic fin on eyed side generally much longer than that of blind side ..... BOTHIDAE

4b. Pelvic fin bases short, that of blind side almost as long as eyed side .... PARALICHTHYIDAE

Family 118 PSETTODIDAE
(Indian Halibuts)

Body oval, flat and highly thick with eyes on either left or right side. The upper eye very close to dorsal margin of body. Mouth large, maxilla extends considerably beyond posterior border of lower eye. Single dorsal fin, long; its origin well behind eyes; anterior fin rays spinous. Lateral line almost straight, with 70 to 75 scales.

Species known to occur in Karnataka

1. *Psettodes erumei* (Bloch) (Indian Halibut)

Fisheries information : The Indian halibut constitute an important fishery in the Chennai and Mumbai coasts. It is found in both coasts of our country.

Family 119 BOTHIDAE
(Lefteye flounders)

Body flat with eyes on left side. Mouth asymmetrical with teeth in jaws. Preopercle exposed, its hind margin free and visible. Pectoral and pelvic fins present; fin rays not branched. Pelvic fin base on blind side shorter than eyed side. Dorsal fin long, inserted above or anterior to eyes continued up to base of caudal fin. Anal fin also long, originating below pectoral fins and continued up to caudal fin base. Caudal fin separate, free from dorsal and anal fins. Fins without spines. Lateral line single.

Species known to occur in Karnataka

1. *Bothus myriaster* (Temminck & Schlegel) (Oval flounder)
2. *Bothus pantherinus* (Ruppell) (Leopard flounder)
3. *Chascanopsetta lugubris* Alcock (Pelican flounder)
4. *Engyprosopon grandisquama* (Temm. & Schlegel) (Large scale flounder)

Key to the species

1a. Maxilla contained less than 2 times in head length; lower jaw very prominent .... *C. lugubris*

1b. Maxilla contained more than 2 times in head length; lower jaw not prominent 2

2a. Lateral line without a forked branch behind upper eye ..... *E. grandisquama*

2b. Lateral line with a forked branch behind upper eye 3

3a. Scales mostly cycloid on ocular side, ctenoid at edges of body ..... *B. myriaster*

3b. Scales all ctenoid on ocular side .... *B. pantherinus*

Fisheries information : The left-eye flounders are of little commercial importance. These fishes are caught as bycatch in the commercial catches.

Family 120 PARALICHTHYIDAE
(Large-tooth flounders)

Body flat with eyes on left side. Mouth asymmetrical; jaws with teeth, well developed on blind side. Preopercle exposed, its hind margin free and visible. Pectoral and pelvic fin rays branched. Pelvic fin bases short and nearly symetrical. Dorsal fin long, inserted above or anterior to eyes. Anal fin long, originating below pectoral fins. Caudal fin free from dorsal and anal fins. Fins without spines. Lateral line single.

Species known to occur in Karnataka

1. *Pseudorhombus arsius* (Hamilton) (Large toothed flounder)
2. *Pseudorhombus elevatus* Ogilby (Deep flounder)
3. *Pseudorhombus javanicus* (Bleeker) (Javan flounder)

4. *Pseudorhombus malayanus* Bleeker (Malayan flounder)
5. *Pseudorhombus triocellatus* (Bloch) (Three spotted flounder)

Key to the species

1a. Anterior rays of dorsal fin longer than that follow; 23 to 25 gill rakers on lower arm of first arch ..... *P. triocellatus*

1b. Anterior rays of dorsal fin not prolonged; 8 to 15 gill rakers on lower arm of first arch 2

2a. Scales on blind side of body ctenoid .... *P. malayanus*

2b. Scales on blind side of body cycloid 3

3a. Teeth strong, widely set, canines large, 6 to 13 teeth on blind side of lower jaw ....*P. arsius*

3b. Teeth smaller, more close set, not enlarged anteriorly, more than 24 teeth on blind side 4

4a. Scales ctenoid on ocular side; upper profile on head notched ..... *P. elevatus*

4b. Scales on ocular side more or less ctenoid anteiorly, mostly cycloid posteriorly; upper profile of head scarcely notched, usually evenly curved ..... *P. javanicus*

Fisheries information : The large-tooth flounders are of minor commercial value. These fishes are captured as bycatch in the commercial catches.

Family 121 SOLEIDAE
(Soles)

Body oval or almost elongate and highly compressed flat fish with eyes dextral (on right side of body). Mouth small and asymmetrical, terminal or slightly inferior. Snout sometimes hook-shaped. Preopercle without a free border, embedded in skin. Dorsal fin extends on head to above eye or forward; dorsal and anal fins free or confluent with caudal fin. Pectoral fins generally absent in adults. Pelvic fins sometimes asymmetrical, either free or joined to anal fin. Lateral line single and straight on body, sometimes branched on head. Scales moderately large, cycloid or ctenoid; sometimes modified into skin flaps fringed with sensory filament.

Species known to occur in Karnataka

1. *Aesopia cornuta* Kaup (Horned sole)
2. *Brachirus orientalis* (Bloch) (Oriental sole)
3. *Solea elongata* Day (Elongate sole)
4. *Synaptura albomaculata* Kaup (Kaup's sole)
5. *Synaptura commersonii* (Lacepede) (Commerson's sole)
6. *Zebrias quagga* (Kaup) (Quagga sole)
7. *Zebrias synapturoides* (Jenkins) (Jenkins's sole)

Key to the species

1a. Gill openings on ocular side ending opposite lower edge or lower part of pectoral fin base; pectoral fins on both sides generally well developed, rounded or obtusely pointed ...2

1b. Gill openings on ocular side ending opposite upper part of pectoral fin base; pectoral fins small, especially on blind side 3

2a. Posterior rays of dorsal and anal fins more or less elongate and confluent to caudal fin; urinogenital papilla situated between the pelvic fin and close to anus .... *B. orientalis*

2b. Posterior rays of dorsal and anal fins short and not confluent with caudal fin; urinogenital papilla situated on right side of the body at some distance from the anus .... *S. elongata*

3a. Opercular membrane not joined to pectoral fins 4

3b. Opercular membranes of both sides of body joined to upper rays of pectoral fins 5

4a. Scales on head and nape of ocular (eyed) side larger than those on body; body without spots; no tentales between nostrils .... *S. commersonii*

4b. Scales on head and body similar in size; 2 or 3 rows of white spots on ocular side of body; a tentale present between nostrils .... *S. albomaculata*

5a. First rays of dorsal fin enlarged and free ... . *A. cornuta*

5b. First ray of dorsal fin not enlarged and free 6

6a. Posterior rays of dorsal and anal fins partly confluent with caudal fin, joined only to basal half of caudal fin, leaving the latter distinct, outline of fins not continuous around caudal fin; eyes without tentacles..... ..... *Z. synapturoides*

6b. Posterior rays of dorsal and anal fins completely confluent to caudal fin, outline of fins continuous around caudal fin ....*Z. quagga*

Fisheries information : The soles of of minor commercial value in general. These fishes are marketed fresh and dried salted.

Family 122 CYNOGLOSSIDAE
(Tongue soles)

Tongue-shaped flat fishes with eyes sinistral (left side of head). Mouth asymmetrical, lips fringed in some, rostral hook present below mouth. Preopercle margin not free, covered with skin and scales. Dorsal fin inserted on head, both dorsal and anal fins united with caudal fin. Pectoral fins absent. Only left pelvic fins present. Dorsal and pelvic fins without spiny rays. Lateral line variable, 0 to 3 on ocular side and 0 to 2 on blind side.

Species known to occur in Karnataka

1. *Cynoglossus arel* (Schneider)(Largescale tongue sole)
2. *Cynoglossus bilineatus* (Lacepede) (Four lined tongue sole)
3. *Cynoglossus carpenteri* Alcock (Hooked tongue sole)
4. *Cynoglossus dispar* Day (Round head tongue sole)
5. *Cynoglossus dubius* Day (Carrot tongue sole)
6. *Cynoglossus lida* (Bleeker) (Rough scale tongue sole)
7. *Cynoglossus lingua* Hamilton (Long tongue sole)
8. *Cynoglossus macrostomus* Norman (Malabar tongue sole)
9. *Cynoglossus punticeps* (Richardson) (Speckled tongue sole)
10. *Paraplagusia bilineata* (Bloch) (Doublelined tongue sole)

Key to the species

1a. Lips with rows of fringed tentacles..... ..... *P. bilineata*

1b. Lips small, not fringed 2

2a. Caudal fin with 12 rays 3

2b. Caudal fin with 8 to 10 rays 4

3a. One lateral line on blind side .....*C. dubius*

3b. Two lateral lines on blind side ....*C. bilineatus*

4a. Two lateral lines on blind side .... *C. dispar*

4b. No lateral line on blind side 5

5a. Scales cycloid on blind side of the body..6

5b. Scales ctenoid on blind side 8

6a. Three lateral line on ocular side..... .....*C. carpenteri*

6b. Two lateral lines on ocular side of the body 7

7a. Scales 11 or 12 between lateral lines on ocular side of the body ..... *C. lingua*

7b. Scales 7 to 9 between lateral lines on ocular side of the body .....*C. arel*

8a. Angle of mouth distinctly nearer to gill opening than tip of snout ..... *C. lida*

8b. Angle of mouth nearer to tip of snout than to gill opening 9

9a. Cleft of mouth extending far back to posterior margin of fixed eye ..... *C. macrostomus*

9b. Cleft of mouth extending to only middle or about posterior border of fixed eye .... *C. puncticeps*

Fisheries information : The tongue soles are of minor commercial value. Many species are important in commercial fisheries and are valued as good food source. Malabar tongue sole constitutes an important fishery in the south-west of our conrty.

Remarks : *Cynoglossus macrolepidosus* (Bleeker) and *Cynoglossus quinqelineatus* Day are referable to *Cynoglossus arel* (Schneider) and *Cynoglossus bilineatus* (Lacepede) respectively (Menon, 1977).

Order XXX TETRAODONTIFORMES

Body usually covered with modified scales. Scales usually modified as spines, shields, or plates. Lateral line present or absent, sometimes multiple. Maxilla usually firmly united or fused with premaxilla. No paretals, nasals, or infraorbitals, and no lower ribs. Hyomandibular and palatine firmly attached to skull. Gill opening restricted. Swim bladder often present. Many fishes are capable of becoming inflate.

Key to families

1a. Teeth fused forming a parrot-like beak; pelvic fins and dorsal fins without spines 2

1b. Teeth not fused to form a parrot-like beak as in 1a 3

2a. Body covered with spines, capable of great inflation; teeth fused into a single beak-like structure in each jaw, without a median suture dividing upper and lower jaw into right and left halves ..... DIODONTIDAE

2b. Body naked or with only small scattered prickles; teeth fused to form a beak-like structure, but separated by a median suture forming 'four toothed' appearance .... TETRAODONTIDAE

3a. Body almost completely encased in a bony shell or carapace formed of enlarged, thickened scale plates, generally hexagonal in shape; spinous dorsal fin absent .... OSTRACIIDAE

3b. Body not encased in a bony shell or carapace; spinous dorsal fin present 4

4a. Pelvic fins represented by a pair of strong spines; dorsal fin with 6 spines (generally only 5 visible, the 6th being very small)..... ..... TRIACANTHIDAE

4b. Pelvic fins and spines very small or absent; dorsal fin with 2 or 3 spines 5

5a. Dorsal fin with 2 spines, only first spine large and prominent; body covered by smooth to rough shagreen like skin consisting of small scales armed with spinules .... MONACANTHIDAE

5b. Dorsal fin with 3 visible spines; body covered with very thick, tough skin with large rectilinear scale plates easily discernible as individual units ..... BALISTIDAE

Family 123 TRIACANTHIDAE
(Tripodfishes)

Body compressed and deep with numerous scales not normally visible individually. Each scale with upright spinules. Mouth small and generally terminal. Dorsal fin with 6 spines (generally 5 visible only, 6th beingvery small) and 20 to 26 rays. Anal finrays 13 to 22. Pelvic fins represented by a large spine which is movably articulated with anterior end of pelvis and capable of being locked erect of the pelvis. Caudal fin deeply forked. Caudal peduncle distinctly tapered.

Species known to occur in Karnataka

1. *Triacanthus biaculeatus* (Bloch) (Short nosed tipodfish)
2. *Pseudotriacanthus strigilifer* (Cantor)(Long spines tripodfish)

Key to the species

1a. Tips of dorsal and ventral spines naked; second dorsal spine more than half the length

of first; spinous dorsal with high scaly sheath ..... *P. strigilifer*

1b. Tips of dorsal and ventral spines covered with integument; second dorsal spine not more than half of first; spinous dorsal without scaly sheath ..... *T. biaculeatus*

Fisheries information : The tripodfishes are of no commercial importance. These fishes are sometimes found in the commercial fish catches.

Remarks : Records of *Triacanthus brevirostris* Schlegel are referable to *T. biaculeatus* (Bloch).

Family 124 BALISTIDAE
(Trigerfishes)

Body usually deep and compressed, covered with thick, tough skin with large rectilinear scale plates. Scales above pectoral fin base usually enlarged and slightly separated, forming a flexible tympanum. Mouth small and terminal. Dorsal fin two, the first with 3 spines and second spine more than one half the length of the first; the spine capable of being locked in an upright position of erction by the second. Most dorsal, anal and pectoral rays branched. Pelvic fins and spines very small or absent, represented by a series of 4 pairs of enlarged scales encasing the end of pelvis.

Species known to occur in Karnataka

1. *Abalistes stellatus* (Lacepede) (Starry triggerfish)

Fisheries information : It is of minor fishery significance. It is highly valued as food fish. It is usually caught incidentally in trawl catches.

Family 125 MONACANTHIDAE
(Leatherjackets)

Body fusiform, deep and compressed covered by smooth to rough shagreen like skin consisting of minute to small scales armed with 1 to many fine spinules. Mouth small, terminal with pointed teeth not fused together. Gill openings small.

Species known to occur in Karnataka

1. *Aluterus monoceros* (Linnaeus) (Unicorn leather jacket)

Fisheries information: The unicorn leather jacket is no commercial value. This species is caught as bycatch in the commercial catches.

Family 126 OSTRACIIDAE
(Boxfish, Cowfish)

Body elongate, almost completely covered in a bony shell or carapace formed of enlarged, thickened scale/ plates, usually hexagonal in shape and firmly sutured to one another. The carapace has opening for mouth, eyes, gill slits, pectoral, dorsal and anal fins and for the flexible caudal peduncle. Scale plates sometimes have surface granulations and in some species these are enlarged into conspicuous carapace spine above eye or long ventrolateral or dorsal angles of body. Mouth small, terminal with fleshy lips. Spinous dorsal and pelvic fins absent. Caudal fin long.

Species known to occur in Karnataka

1. *Lactoria cornuta* (Linnaeus) (Longhorn cowfish)
2. *Ostracion meleagris* Shaw (Whitespotted boxfish)
3. *Tetrosomus gibbosus* (Linnaeus) (Hunchback boxfish)

Key to the species

1a. Body triangular in cross secion, carapace 5 angled (two dorsolateral ridges low and indistinct) ..... *T. gibbosus*

1b. Body not triangular in cross secion, carapace with 4 or 5 angle 2

2a. Carapace 4 angled, no ridge along middle of back, no spines on carapace ... *O. meliagris*

2b. Carapace 5 angled a central ridge along back; a prominent horn like spine projecting forward from eye; another spine projecting posteriorly from ventrolateral ridge ..... *L. cornuta*

Fisheries information : The boxfishes and cowfishes are of no commercial value. These fishes are captured in the commercial catches as bycatch.

Remarks : *Ostracion meleagris* Shaw has been reorded as *Ostracion lentiginosa* (Bloch).

Family 127 TETRAODONTIDAE
(Pufferfishes)

Body naked or with only short prickles. Body heavy and blunt capable of rapid inflation by intake of water (or air). Jaws modified to form a beak of heavy, powerful teeth, 2 above and 2 below. Gill openings simple slits anterior to pectoral fins. Pelvic fins absent. Dorsal and anal fins inserted far posteriorly, without spines, but each with 7 to 15 rays. Caudal fin truncate, rounded or emarginate to almost lunate.

Species known to occur in Karnataka

1. *Lagocephalus inermis* (Temminck & Schneider) (Smooth blaasop)
2. *Lagocephalus lunaris* (Bloch & Schneider) (Green rough-backed puffer)
3. *Lagocephalus spadiceus* (Richardson) (Half-smooth golden pufferfish)

Key to the species

1a. No spinules on dorsal surface of head and body ..... *L. inermis*

1b. Spinules present on dorsal surface of body and head 2

2a. Spinules on dorsal surface of body extend to or beyond dorsal fin origin ..... *L. lunaris*

2b. Spinules on dorsal surface of body extend only about halfway to dorsal fin .... *L. spadiceus*

Fisheries information : These fishes are of no fishery importance. Some are considered to be toxic.

Family 128 DIODONTIDAE
(Porcupinefish)

Body fusiform and capable of inflation, covered with well developed sharp spines. Long spines are generally erctile and two rooted, while short spines are fixed in an erect position by three rooted bases. Head broad and blunt. Mouth terminal with two fused teeth in jaws to form a beak-like structure without a median suture dividing upper and lower jaws into right and left halves. Dorsal and anal fins without spines, inserted far back on body. Pelvic fins absent. Caudal fin rounded.

Species known to occur in Karnataka

1. *Chilomycterus orbicularis* (Bloch) (Birdbeak burrfish)
2. *Diodon holocanthus* Linnaeus (Ballon fish)
3. *Diodon hystrix* Linnaeus (Porcupinefish)

Key to the species

1a. All spines three or four rooted and fixed except possibly one or two immediately behind the pectoral fin base or near the corner of the mouth ..... *C. orbicularis*

1b. All spines two rooted, long and erectile, except for a few around gill openings, dorsal fin base and on caudal peduncle 2

2a. None of the spines wholly on caudal peduncle; body with several large dark blotches; no small dark spots on fins .... *D. holocanthus*

2b. One or more small spines wholly on the dorsal surface of caudal peduncle; body without large dark blotches; all fins heavily spotted ..... *D. hystrix*

Fisheries information : The porcupine or ballonfishes are of no commercial importance. These fishes are captured along with the commercial fishes as bycatch.

Remarks : *Diodon holocanthus* Linnaeus has been recorded as *Diodon maculifer* Kaup.

DISCUSSION

The present account included 570 species belonging to 128 families and 30 orders from marine and estuarine waters of the maritime state Karnataka, west coast of India. Apart from giving remarks related to synonymy under most of the families, there were few more taxonomic confusions prevailed that require detailed discussion.

Report of *Glyphis gangeticus* (Muller & Henle) from Karnataka coast is questionable. This shark is known from the Gangetic estuary only. Records of this species from other parts may possibly misidentification of superficially similar species, such as *Carcharhinus leucas* (Valenciennes).

There is a report of *Sphyrna tudes* (Valenciennes) from Karnataka coast. *S. tudes* is known from southeast Atlantic, the Mediterranean Sea and eastern Pacific. Its occurrence along Indian coast is doubtful. All reports of *S. tudes* from India are based on *Zygaena tudes* of Day (1889) which is considered by Talwar and Kacker (1984) as referable to *S. lewini* (Griffith & Smith).

Reports of *Gymnura micrura* (Bloch & Schneider) from Indian coast following Day (1878) are erroneous and all are referable to *Gymnura poecilura* (Shaw). The former species is having a shorter tail and 6 dark rings on tail while the figure in Day (1878) and Day (1889) is clearly with a longer tail and 9 dark rings indicating it being the later species.

Mobula diabolus (Shaw) is relegated to synonymy of *Mobula mobular* (Bonnaterre) (Compagno, 1999). Hence, records of *M. diabolus* from Indian coast (Misra, 1969; Talwar and Kacker, 1984) are referable to *Mobula eregoodootenkee* (Bleeker).

Record of *Engraulis telera* (Day) from Karnataka coast is questionable. *E. telera* is referable to *Setipinna brevifilis* (Valenciennes), known from the Ganges River; *Setipinna wheeleri* Wongratana, known from Myanmar; or *Setipinna phasa* (Hamilton), known from the Ganges, Orissa and West Bengal coast (Whitehead *et al*, 1988). Only *Setipinna taty* (Valenciennes) is a wide ranging fish of the genus, but not usually occur along west coast of India. Hence, record of *E. telera* by Rajagopal *et al* (1978) from Karnataka coast needs to be verified.

A species of the genus *Caranx* with a combination of characters, 'breast scaleless except for a patch in front of ventral fin; 20 to 22 dorsal soft rays and 15 to 18 anal fin rays; lateral line scutes 33 to 37; and no opercular spot' has been determined as *C. carangus* by Day (1875) and the same was followed by subsequent authors including Talwar and Kacker (1984). These characters are entirely go with *Caranx ignobilis* as given in Smith-Vaniz (1984) and so, it has been observed that Indian Ocean records of *C. carangus* are probably misidentifications of *C. ignobilis* (Forsskal) (Froese and Pauly, 2009). Further, it is to be noted that Day (1875) has not included *C. ignobilis* in his account. Smith-Vaniz *et al* (1990) has considered *C. carangus* as a junior synonym of *Caranx hippos* (Linnaeus), a species restricted to Atlantic Ocean. Day (1875) also described a species with 'completely scaled breast and small opercular spot' as *Caranx hippos,* which is referable to *Caranx sexfasciatus* Quoy and Gaimard (Talwar and Kacker, 1984). Hence, none of these two species of Day (1875) can be regarded as valid to consider occurrence of *C. hippos* along Indian coast. Moreover, distinction of *C. carangus* and *C. ignobilis* in Talwar & Kacker (1984) as well as Talwar & Jhingran (1991), where a lower count of lateral line scutes for *C. ignobilis* has been recorded, is erroneous.

Type specimen of *Leiognathus brevirostris* (Valenciennes) (MNHN A-6763) is found to be a deep bodied one with equally convex dorsal and ventral profiles and hence regarded as *Photopectoralis bindus* (Valenciennes) (Jones, 1985; Chakrabarty and Sparks, 2007). But Indian specimens determined as *L. brevirostris* or *L. decorus* (De Vis) having a dark nuchal blotch are relegated to synonymy of *N. gerreoides* (Bleeker) (Kimura *et al*, 2008).

Talwar (1995) has omitted *Bola coibor* of Hamilton (1822) completely. Eschmeyer (2006) recognizes *Nibea coibor* (Hamilton) as a valid species. As per the description provided by Hamilton (1822) this is a very rare species with 24 rays in dorsal fin and sides with bright golden shine and deep yellow ventrally. Jayaprakash (1975) reported *Nibea chui* Trewavas from Bombay and the same collection was studied by Talwar (1995). The low soft ray count (24 rays)

of dorsal fin led Jayaprakash (1975) to determine it as *N. chui* following Fischer and Whitehead (1974). Talwar (1995) gave a description of the preserved specimen of Jayaprakash (1975) and stated to have dorsal fin elements IX + I, 24 and gill rakers 6+1+11. But *N. chui* is supposed to have X + I, 24-25 dorsal fin elements and 9 or 10 lower gill rakers (Fischer and Whitehead, 1974). Moreover, *N. chui* is known from Japan and Taiwan region in western Pacific. Although, type material for *Nibea coibor* is not available for necessary comparison, it is supposed that *N. chui* is misapplied to *N. coibor* in Indian region. The silvery grey colour of Bombay specimens may be attributed to environmental varation.

SUMMARY

The maritime state Karnataka is situated on the west coast of India with the Arabian Sea on its west side. The icthyofaunal diversity of the marine and estuarine water bodies of all three coastal districts of Karnataka have been studied. The present study reveals that the faunal diversity of Karnataka coast comprises 570 species of fishes belonging to 301 genera, 128 families and 30 orders. A brief description of all the families along with the key to systematic categories is included in this present work. English common names of the enlisted species have been provided given within parentheses. Where ever it necessitated taxonomic remarks also furnished.

ACKNOWLEDGEMENTS

The authors are thankful to the Director, Zoological Survey of India, Kolkata for giving oppertunity and providing facilities to carry out this study. They also extend their thankfulness to Sri A.K. Singh, Joint Director, Zoological Survey of India, Kolkata for encouragements and valuable suggestions. Thanks are also due to Director of Fisheries, Govt. of Karnataka, Bangaluru and his colleagues for their cooperation during the survey programme along Karnataka coast.

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Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 389-434, 2013

AMPHIBIA

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INTRODUCTION

Bio-geographically, the Karnataka State of India is divisible into three regions, the Coastal Karnataka, Western Ghats and Deccan Plateau (Eastern Plains). The State is endowed with great diversity of climate, topography and soil types. Temperature ranges from a minimum of 3^0 C in the hills in winter to 48^0 C in the plains in summer. Rainfall varies from 400 mm in the plains to over 7,500 mm in the Agumbe region of the Western Ghats. Altitude varies from sea level elevation in the West Coast to 1930 m at Mullayanagiri Peak (Chikkamagaluru district), which is the highest mountain peak in Karnataka. The State hosts 320 km long portion of the Western Ghats. The State is having a forest cover of 38,284.30 Sq. kms, (Ministry of Agriculture Land Use Statistics, 2005). The varying environmental regimes and edaphic factors in the State are reflected in its floral and faunal composition.

Karnataka has a rich diversity of amphibian fauna (Rao, 1920, 1922 and 1937; Pillai, 1977; Daniels, 1991; Dutta and Ray, 2000; Das, 2000; Biju, 2001; Krishnamurthy *et al.*, 2001; Kuramoto and Joshy, 2003; Das and Kunte, 2005; Ravichandran and Krishnan, 2006; Dinesh and Radhakrishnan, 2007; Bhatta *et al.*, 2007; Gururaja *et al.*, 2007; Kuramoto *et al.*, 2007; Dinesh *et al.*, 2007; Biju and Bossuyt, 2009; Joshy *et al.*, 2009).

The present account deals with all the valid taxa of Amphibia known from Karnataka, till June 2010. The collections studied by scientists other than those in ZSI and included in the present study are marked in asterisks (*). The classification followed here is primarily after Frost (2010). A total of 88 species, arranged under 24 genera and 10 families are known to occur in the State.

For additional information on taxonomy, species account and distributional details, Dutta (1997), Chanda (2002), Frost (2010), Dinesh *et al.*, (2009) and Biju *et al.*, 2010 may be referred to.

SYSTEMATIC LIST

Class AMPHIBIA Gray

Order ANURA Fischer von Waldheim

Family BUFONIDAE Gray

Genus ***Duttaphrynus***, Frost, Grant, Faivovich, Bain, Haas, Hddad, Desa, Channing, Wilkinson, Donnellan, Raxworthy, Campbell, Blotto, Moler, Drewes, Nussbaum, Lynch, Green and Wheeler

1. *Duttaphrynus brevirostris* (Rao, 1937)
2. *Duttaphrynus hololius* (Gunther, 1876)
3. *Duttaphrynus melanostictus* (Schneider, 1799)
4. *Duttaphrynus microtympanum* (Boulenger, 1882)
5. *Duttaphrynus parietalis* (Boulenger, 1882)

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6. *Duttaphrynus scaber* (Schneider, 1799)
7. *Duttaphrynus stomaticus* (Lutken, 1864)

Genus ***Ghatophryne*** Biju, Bocxlaer, Giri, Loader and Bossuyt

8. *Ghatophryne ornata* (Gunther, 1876)

Genus ***Pedostibes*** Gunther

9. *Pedostibes tuberculosus* Gunther, 1875

Family DICROGLOSSIDAE Anderson

Sub-Family DICROGLOSSINAE Anderson

Genus ***Euphlyctis*** Fitzinger

10. *Euphlyctis aloysii* Joshy, Alam, Kurabayashi, Sumida and Kuramoto, 2009
11. *Euphlyctis cyanophlyctis* (Schneider, 1799)
12. *Euphlyctis hexadactylus* (Lesson, 1834)
13. *Euphlyctis mudigere* Joshy, Alam, Kurabayashi, Sumida and Kuramoto, 2009

Genus ***Fejervarya*** Bolkay

14. *Fejervarya caperata* Kuramoto, Joshy, Kurabayashi and Sumida, 2007
15. *Fejervarya granosa* Kuramoto, Joshy, Kurabayashi and Sumida, 2007
16. *Fejervarya keralensis* (Dubois, 1980)
17. *Fejervarya kudremukhensis* Kuramoto, Joshy, Kurabayashi and Sumida, 2007
18. *Fejervarya mudduraja* Kuramoto, Joshy, Kurabayashi and Sumida, 2007
19. *Fejervarya mysorensis* (Rao, 1922)
20. *Fejervarya rufescens* (Jerdon, 1853)
21. *Fejervarya sauriceps* (Rao, 1937)

Genus ***Hoplobatrachus*** Peters

22. *Hoplobatrachus crassus* (Jerdon, 1854)
23. *Hoplobatrachus tigerinus* (Daudin, 1802)

Genus ***Minervarya*** Dubois, Ohler and Biju

24. *Minervarya sahyadris* Dubois, Ohler and Biju, 2001

Genus ***Sphaerotheca*** Gunther

25. *Sphaerotheca breviceps* (Schneider, 1799)
26. *Sphaerotheca dobsonii* (Boulenger, 1882)
27. *Sphaerotheca leucorhynchus* (Rao, 1937)

Family MICRIXALIDAE Dubois, Ohler and Biju

Genus ***Micrixalus*** Boulenger

28. *Micrixalus elegans* (Rao, 1937)
29. *Micrixalus fuscus* (Boulenger, 1882)
30. *Micrixalus kottigeharensis* (Rao, 1937)
31. *Micrixalus narainensis* (Rao, 1937)
32. *Micrixalus phyllophilus* (Jerdon, 1853)
33. *Micrixalus saxicola* (Jerdon, 1853)
34. *Micrixalus swamianus* (Rao, 1937)

Family MICROHYLIDAE Gunther

Sub-Family MICROHYLINAE Gunther

Genus ***Kaloula*** Gray

35. *Kaloula taprobanica* Parker, 1934

Genus ***Microhyla*** Tschudi

36. *Microhyla ornata* (Dumeril and Bibron, 1841)
37. *Microhyla rubra* (Jerdon, 1854)
38. *Microhyla sholigari* Dutta and Ray, 2000

Genus ***Ramanella*** Rao and Ramanna

39. *Ramanella minor* Rao, 1937
40. *Ramanella montana* (Jerdon, 1854)
41. *Ramanella mormorata* Rao, 1937
42. *Ramanella triangularis* (Gunther, 1876)
43. *Ramanella variegata* (Stoliczka, 1872)

Genus ***Uperodon*** Dumeril and Bibron

44. *Uperodon globulosus* (Gunther, 1864)
45. *Uperodon systoma* (Schneider, 1799)

Family NYCTIBATRACHIDAE Blommers-Schlosser

Genus ***Nyctibatrachus*** Boulenger

46. *Nyctibatrachus aliciae* Inger, Shaffer, Koshy and Bakde, 1984
47. *Nyctibatrachus dattatreyaensis* Dinesh, Radhakrishnan and Bhatta, 2008

48. *Nyctibatrachus humayuni* Bhaduri and Kripalani, 1955
49. *Nyctibatrachus karnatakaensis* Dinesh, Radhakrishnan, Reddy and Gururaja, 2007
50. *Nyctibatrachus kempholeyensis* (Rao, 1937)
51. *Nyctibatrachus major* Boulenger, 1882
52. *Nyctibatrachus petraeus* Das and Kunte, 2005
53. *Nyctibatrachus sanctipalustris* Rao, 1920
54. *Nyctibatrachus sylvaticus* Rao, 1937

Family RANIDAE Rafinesque

Genus ***Clinotarsus*** Mivart

55. *Clinotarsus curtipes* (Jerdon, 1853)

Genus ***Hylarana*** Tschudi

56. *Hylarana aurantiaca* (Boulenger, 1904)
57. *Hylarana malabarica* (Tschudi, 1838)
58. *Hylarana temporalis* (Gunther, 1864)

Family RANIXALIDAE Dubois

Genus ***Indirana*** Laurent

59. *Indirana beddomii* (Gunther, 1875)
60. *Indirana gundia* (Dubois, 1986)
61. *Indirana leithii* (Boulenger, 1888)
62. *Indirana leptodactyla* (Boulenger, 1882)
63. *Indirana longicrus* (Rao, 1937)
64. *Indirana tenuilingua* (Rao, 1937)

Family RHACOPHORIDAE Hoffman

Sub-Family RHACOPHORINAE Hoffman

Genus ***Polypedates*** Tschudi

65. *Polypedates maculatus* (Gray, 1833)
66. *Polypedates occidentalis* Das and Dutta, 2006
67. *Polypedates pseudocruciger* Das and Ravichandran, 1998

Genus ***Pseudophilautus*** Laurent

68. *Pseudophilautus amboli* (Biju and Bossuyt, 2009)

Genus ***Raorchestes*** Biju, Shouche, Dubois, Dutta and Bossuyt

69. *Raorchestes bombayensis* (Annandale, 1919)
70. *Raorchestes charius* (Rao, 1937)
71. *Raorchestes chromasynchysi* (Biju and Bossuyt, 2009)
72. *Raorchestes flaviventris* (Boulenger, 1882)
73. *Raorchestes glandulosus* (Jerdon, 1854)
74. *Raorchestes luteolus* (Kuramoto and Joshy, 2003)
75. *Raorchestes neelanethrus* (Gururaja, Aravind, Ali, Ramachandra, Velavan, Krishnakumar and Aggarwal, 2007)
76. *Raorchestes tuberohumerus* (Kuramoto and Joshy, 2003)

Genus ***Rhacophorus*** Kuhl and Van Hasselt

77. *Rhacophorus lateralis* Boulenger, 1883
78. *Rhacophorus malabaricus* Jerdon, 1870

Order GYMNOPHIONA Muller

Family CAECILIIDAE Rafinesque

Genus ***Gegeneophis*** Peters

79. *Gegeneophis carnosus* (Beddome, 1870)
80. *Gegeneophis goaensis* Bhatta, Dinesh, Prashanth and Kulkarni, 2007
81. *Gegeneophis krishni* Pillai and Ravichandran, 2005
82. *Gegeneophis madhavai* Bhatta and Srinivasa, 2004
83. *Gegeneophis mhadeiensis* Bhatta, Dinesh, Prashanth and Kulkarni, 2007
84. *Gegeneophis nadkarnii* Bhatta and Prashanth, 2004

Family ICHTHYOPHIIDAE Taylor

Genus ***Ichthyophis*** Fitzinger

85. *Ichthyophis beddomei* Peters 1879
86. *Ichthyophis bombayensis* Taylor, 1960
87. *Ichthyophis kodaguensis* Wilkinson, Gower, Govindappa and Venkatachalaiah, 2007

Genus ***Uraeotyphlus*** Peters

88. *Uraeotyphlus narayani* Seshachar, 1939

SYSTEMATIC ACCOUNT

Class AMPHIBIA Gray

Order ANURA Fischer von Waldheim

Family BUFONIDAE Gray

Genus ***Duttaphrynus***, Frost, Grant, Faivovich, Bain, Haas, Hddad, Desa, Channing, Wilkinson, Donnellan, Raxworthy, Campbell, Blotto, Moler, Drewes, Nussbaum, Lynch, Green and Wheeler

1. *Duttaphrynus brevirostris* (Rao, 1937)*
Kempholey Toad

1937. *Bufo brevirostris* Rao, *Proc. Indian Acad. Sci., Ser. B*, **6**: 403.

2009. *Duttaphrynus brevirostris* - Van Bocxlaer, Biju, Loader, and Bossuyt, 2009, *BMC Evol. Biol.*, **9** (e131): 4.

Diagnosis: Dorsum pale brown with a network of dark lines; sides lighter with similar marbling. Venter dirty white with dark blotches under surface of thighs; dorsal skin covered with small and uniformly distributed tubercles. A small row of larger warts present on the median line on the back; the first pair being the largest. A number of spine granules are present on the throat and abdomen and these are more prominent on the limbs. A dark temporal line on the sides. Head rounded, not projecting beyond the mouth, Nostril closer to the snout than to eye; inter-narial distance about two thirds the distance of the inter-orbital width. Tympanum small, prominent and two thirds of the diameter of the eye. Fore limbs very short. Parotoid glands are moderately prominent elongate and as long as the forelimb. Hind limb short, tibiotarsal articulation not reaching the shoulder. Toes very short, the tips obtusely pointed and entirely free. Sub-articular tubercles of the toes are not prominent. Both inner and outer metatarsal tubercle present.

Distribution : Karnataka and Kerala (Dinesh *et al.*, 2009).

Elsewhere : Not known.

Note : Type of this species is found to be lost and it needs type designation from the type locality. Endemic to Western Ghats, distribution in Kerala doubtful.

2. *Duttaphrynus hololius* (Gunther, 1876)*
Malabar Toad

1876. *Bufo hololius* Gunther, "1875", *Proc. Zool. Soc. London*, 1875: 569.

2009. *Duttaphrynus hololius* - Van Bocxlaer, Biju, Loader, and Bossuyt, 2009, *BMC Evol. Biol.*, **9** (e131): 4.

Diagnosis: Dorsum olive brown, more or less smooth, parotoids flat. Venter dull-whitish, granular. Head broader than long; without bony ridges; snout short, depressed, projecting beyond the mouth; nostril nearer the tip of the snout than the eye. Inter-orbital width broader than that of upper eyelid; tympanum very distinct, as long as the diameter of the eye. Fingers free, first longer than second; tips of the fingers and toes blunt. Toes minutely webbed; two small metatarsal tubercle present. Tarso-metatarsal articulation reaches the eye.

Distribution : Andhra Pradesh, Karnataka, Kerala and Tamil Nadu (Dutta, 1997 and Biju, 2001).

Elsewhere : Not known.

Note : This species is presumed to be endemic to Andhra Pradesh (for details on the distributional record of this species, refer Radhakrishnan and Ravichandran (1999).

3. *Duttaphrynus melanostictus* (Schneider, 1799)
Common Indian Toad

1799. *Bufo melanostictus* Schneider, *Hist. Amph. Nat.*: 216.

1802. *Bufo chlorogaster* Daudin, *(An. XI), Hist. Nat. Rain. Gren. Crap., Quarto*: 49.

1802. *Rana dubia* Shaw, *Gen. Zool.*, **3**(1): 157.

1802. *Bufo scaber* Daudin, *(An. XI), Hist. Nat. Rain. Gren. Crap., Quarto*: 94.

1802. *Bufo bengalensis* Daudin, *(An. XI), Hist. Nat. Rain. Gren. Crap., Quarto*: 96.

1802. *Bufo flaviventris* Daudin, *(An. XI), Hist. Nat. Rain. Gren. Crap., Quarto*: **74**, pl. 74,

1802. *Rana melanosticta* Shaw, *Gen. Zool.*, **3**(1): 174.

1833. *Bufo carinatus* Gray, *Ill. Indian Zool.*: pl. 83.

1833. *Bufo dubia* - Gray, *Ill. Indian Zool.*: viii, 83.

1834. *Bufo isos* Lesson, *In Belanger (ed.), Voy. Indes-Orientales N. Eur. Caucase Georgie Perse, Zool.*: 333.

1858. *Bufo gymnauchen* Bleeker, *Natuurkd. Tijdschr. Nederl. Indie*, **16**: 46.

1861. *Docidophryne isos* - Fitzinger, "1860", *Sitzungsber. Akad. Wiss. Wien, Phys. Math. Naturwiss. Kl.*, **42**: 415.

1861. *Docidophryne spinipes* Fitzinger, "1860", *Sitzungsber. Akad. Wiss. Wien, Phys. Math. Naturwiss. Kl.*, **42**: 415.

1862. *Phrynoidis melanostictus* Cope, *Proc. Acad. Nat. Sci. Philadelphia*, **14**: 358.

1867. *Bufo spinipes* Steindachner, Reise *Osterreichischen Fregatte Novara, Zool.*: 42.

1903. *Bufo longecristatus* Werner, *Zool. Anz.*, **26**: 252.

1937. *Bufo tienhoensis* Bourret, *Annexe Bull. Gen. Instr. Publique, Hanoi, 1937*: **6**, 11.

1942. *Docidophryne melanostictus* Bourret, *Batr. Indochine*: 173.

1980. *Bufo camortensis* Mansukhani and Sarkar, *Bull. Zool. Surv. India*, **3**: 97.

1990. *Ansonia kamblei* Ravichandran and Pillai, *Rec. Zool. Surv. India*, **86**: 506.

2001. *Bufo melanostictus melanostictus* Khan, *Pakistan J. Zool.*, **33**: 297.

2006. *Duttaphrynus melanostictus* - Frost, Grant, Faivovich, Bain, Haas, Haddad, de Sá, Channing, Wilkinson, Donnellan, Raxworthy, Campbell, Blotto, Moler, Drewes, Nussbaum, Lynch, Green, and Wheeler, *Bull. Am. Mus. Nat. Hist.*, **297**: 365.

Material examined: 1 ex., (ZSIA 10825), near forest naka, Mysore, Dist.- Mysore, 10-xi-1962; 3 exs, (ZSIA 10912 & 10914), Hassan, Dist.- Hassan, 2.xi.1969; 1 ex., (ZSIA 10839), Dwarasamudra, 32 Km. from Hassan, Dist.-Hassan, 3.xi.1969; 3 exs., (ZSIA 10915, 10960 & 10854), Sakleshpur, Dist.- Hassan, 5-6.xi.1969; 1 ex., (ZSIA 9085), Luckunda Estate Virajpet Dist., Srimangala Nadu, Coorg, 22.viii.1998; 1 ex., (ZSIA 10603), Manun, 25 Km. from Haveri camp, Dist- Haveri, 28.viii.2005; 1 ex., (ZSIA 10197), Ballae halli reserve forest, Agumbe, Dist.-Shimoga, 28.viii.2005; 1 ex., (ZSIA 10206), around PWD IB, Agumbe, Dist.- Shimoga, 30.ix.2004; 2 exs., (ZSIA 10061), forest edge, Gundia, Dist., 18.ix.2004; 3 exs., (ZSIA 10160 & ZSIA 10165, ZSIA 10166), Kottigehra, 26.ix.2004; 1 ex., (ZSIA 10899), Hatraegate pump house, 8 Km from FRH Medikeri, Dist.-Kodagu, 11.xi.2003; 1 ex., (ZSIA 10909), Perambady, 43 km. from FRH. Medikeri, Dist.-Kodagu, 13xi.2003; 1 ex., (ZSIA 10897), Mannagunddy, 15 Km. to Gungia FRH, Dist.-Dakshin Kannada, 21.11.2003; 1 ex., WGRC/V/A/149, Nagur, Coorg, 11.i.1985; 3 exs., WGRC/V/A/726, Bygoor, Chikkamagaluru, 22.v.2005; 1 ex., WGRC/V/A/739, Hipla camp, Chikkamagaluru, 12.xi.2006; 1 ex.,WGRC/V/A/750, Kavalapura BWLS, Chikkamagaluru, 20.xi.2007; 1 ex., WGRC/V/A/706, Shirgola, Chickmagalur, 17.xi.2007.

Diagnosis: Dorsally yellow brown, ventrally yellowish. Skin rough with spiny warts and tubercles. Tympanum very prominent, large, more than ? diameter of eye. Parotoid glands large and prominent. Tibiotarsal articulation reaches eyes when the leg is held along the body. Fingers free; toes half webbed. A moderately large inner and a small outer metatarsal tubercle present.

Distribution : All over India (Dutta, 1997).

Elsewhere : Throughout southern Asia (Frost, 2010).

4. ***Duttaphrynus microtympanum*** (Boulenger, 1882) **Small-eared Toad**

1882. *Bufo microtympanum* Boulenger, *Cat. Batr. Sal. Coll. Brit. Mus., Ed.* **2**: 307.

2006. *Duttaphrynus microtympanum*- Frost, Grant, Faivovich, Bain, Haas, Haddad, de Sá, Channing, Wilkinson, Donnellan, Raxworthy, Campbell, Blotto, Moler, Drewes, Nussbaum, Lynch, Green, and Wheeler, *Bull. Am. Mus. Nat. Hist.*, **297**: 365.

Material examined: 3 exs., WGRC/V/A/725, Chowdikattae, BWLS, Chikkamagaluru, 6.xi.2006; 3 exs., WGRC/V/A/730, Halagekerae, BWLS, Chikkamagaluru, 15.xi.2007; 4 exs., WGRC/V/A/733, Kadubailu, BWLS, Chikkamagaluru, 13.xi.2006; 10 exs., WGRC/V/A/741, Saave, BWLS, Chikkamagaluru, 5.xi.2006; 5 exs., WGRC/V/A/759, Sukhalhatti, BWLS, Chikkamagaluru, 4.xi.2006.

Diagnosis: Medium sized toad, total SVL reaching up to 75 mm in length, this species is more similar to *D. melanostictus* but can be distinguished in having a very small tympanum which is half or less than the diameter of the eye.

Distribution : Kerala, Tamil Nadu (Dutta, 1997) and Karnataka (in press).

Elsewhere : Not known.

Note : Endemic to Western Ghats.

5. ***Duttaphrynus parietalis*** (Boulenger, 1882)
Ridged Toad

1882. *Bufo parietalis* Boulenger, *Cat. Batr. Sal. Coll. Brit. Mus., Ed.* **2**: 312.

2009. *Duttaphrynus parietalis* - Van Bocxlaer, Biju, Loader, and Bossuyt, 2009, *BMC Evol. Biol.*, **9** (e131): 4.

Material examined: 1 ex., (ZSIA10100), Subramanya, Dist.- Dakshin Kannada; 1 ex., (ZSIA 10883), Bemanholai hill, 6 km. from Subramanya, Dist.- Dakshin Kannada, 27.xi.2003.

Diagnosis: Medium sized toad. Dorsal surface uniform light brown and the ventral surface marbled with brown. A dark line extends from the orbito-tympanic crest along the lateral edge of the parotoid glands, which is also present in the juvenile forms. The skin on the upper side with numerous warts of irregular size, of which those on the middle of the back are comparatively larger in size. Parotoid glands are moderately large, elongate and elliptical in shape. The snout is short and blunt and the head is broad and triangular in shape. Tympanum is distinct and about two-thirds diameter of the eye. First finger longer than the second, Tibiotarsal articulation reaching between the eye and the tip of snout. Toes half-webbed. Two moderately developed metatarsal tubercle present

Distribution : Karnataka, Kerala, Tamil Nadu and Andhra Pradesh (Dutta, 1997).

Elsewhere : Not known.

Note : Endemic to peninsular India.

6. ***Duttaphrynus scaber*** (Schneider, 1799)
Ferguson's Toad

1799. *Bufo scaber* Schneider, *Hist. Amph. Nat.*: 222.

1892. *Bufo fergusonii* Boulenger, *J. Bombay Nat. Hist. Soc.*, 7: 317.

2009. *Duttaphrynus scaber* - Van Bocxlaer, Biju, Loader, and Bossuyt, 2009, *BMC Evol. Biol.*, **9** (e131): 4.

Material examined: 2 ex., (ZSIA 10913), Chitradurga, Dist:-Chitradurga, 26.viii.2005.

Diagnosis: Dorsum olive brown; ventral dull whitish; dorsum skin rough with less spiny wart; ventral granular. Head broader than long, with weak, less cornified bony ridges; snout rounded, nearly equal the diameter of the eye; nostril a little nearer to the tip of snout than to the eye. Inter-orbital width broader than that of upper eyelid; tympanum very distinct, more than the half diameter of the eye. Fingers free; first equals the second, tips of fingers and toes swollen. Toes half webbed, more than three phalanges of fourth toe tree; two oval (inner and outer) metatarsal tubercles present. Tarso-metatarsal articulation reaches the eye.

Distribution : Orissa, Karnataka, Kerala and Tamil Nadu (Biju, 2001).

Elsewhere : Sri Lanka (Dutta, 1997).

Note : Endemic to India and Sri Lanka.

7. ***Duttaphrynus stomaticus*** (Lutken, 1864)
Assam Toad

1864. *Bufo stomaticus* Lutken, "1863", *Vidensk. Medd. Dansk Naturhist. Foren., Ser. 2,* **4**: 305.

1883. *Bufo andersonii* Boulenger, *Ann. Mag. Nat. Hist., Ser. 5,* **12**: 163.

1884. *Bufo Andersonii* Murray, *Vert. Zool. Sind*: 401.

1920. *Bufo stomaticus stomaticus* Rao, *J. Nat. Hist. Soc. Bombay*, **27**: 126.

1920. *Bufo stomaticus peninsularis* Rao, *J. Nat. Hist. Soc. Bombay*, 27: 126.

2009. *Duttaphrynus stomaticus* - Van Bocxlaer, Biju, Loader, and Bossuyt, 2009, *BMC Evol. Biol.*, 9 (e131): 4.

Material examined: 1 ex., (ZSI A10855), Sakleshpur, Dist.-Hassan, 6.xi.1969; 1 ex., (ZSIA 10945), Kempholey, Sakleshpur, Dist: Hassan, 16.ix.2004.

Diagnosis: Dorsum brownish, venter dull whitish; dorsum rough with several non-spiny warts. Head broader than long; without bony ridges; snout rounded, nostril nearer to the tip of the snout than to the eye. Inter-orbital width broader than that

of upper eyelid; tympanum very distinct, nearly once the diameter of the eye. Fingers free, first a little longer than second, tips of fingers and toes swollen. Toes more than half-webbed two phalanges of fourth toe free; two oval (inner and outer) metatarsal tubercles present. Tarso-metatarsal articulation reaches in between tympanum and eye; Parotoids large, flat not kidney-shaped.

Distribution : Western and Eastern Himalayas, Assam, West Bengal, Uttar Pradesh, Bihar, Rajasthan, Orissa, Maharashtra, Andhra Pradesh and Karnataka, (Dutta, 1997 and Chanda, 2002).

Elsewhere : Iran, Afghanistan, Pakistan, Bangladesh and Nepal (Frost, 2010).

Genus ***Ghatophryne*** Biju, Bocxlaer, Giri, Loader and Bossuyt

8. ***Ghatophryne ornata*** (Gunther, 1876)*
Malabar Torrent Toad

1882. *Bufo pulcher* Boulenger, *Cat. Batr. Sal. Coll. Brit. Mus.*, Ed. **2**: 288.

1876. *Ansonia ornata* Gunther, "1875", *Proc. Zool. Soc. London*, 1875: 568.

2009. *Ghatophryne ornata* - Biju, Bocxlaer, Giri, Loader and Bossuyt, *BMC Research Notes,* **2**:241.

Diagnosis: Dorsum black with greenish spots on the head. Ventral side black with bright yellowish spot. Skin finely tuberculated at the anterior half of the body, while the rest of the body is smooth. Head without bony ridges. Snout short, slightly broader than the upper eyelids. Tympanum distinct, half the diameter of the eye. Parotoid glands absent. Forelimbs moderate; fingers rather slender, first finger much shorter than second. Tips of the finger and toes are slightly swollen. Toes short, almost fully webbed. Sub-articular tubercles of fingers and toes are moderately prominent. Hindlimbs moderately long.

Distribution : Karnataka and Kerala (Dinesh *et al.*, 2009).

Elsewhere : Not known.

Note : Endemic to Western Ghats.

Genus ***Pedostibes*** Gunther

9. ***Pedostibes tuberculosus*** Gunther, 1875
Malabar Tree Toad

1876. *Pedostibes tuberculosus* Gunther, "1875", *Proc. Zool. Soc. London, 1875*: 576.

1882. *Nectophryne tuberculosa* Boulenger, *Cat. Batr. Sal. Coll. Brit. Mus., Ed.* **2**: 280.

Material examined: 1 ex., WGRC/V/A/578, Bhagavathi Forest KNP, Chickmagalur, 24.x.2005.

Diagnosis: A slender tree toad with the tips of fingers and toes dilated into truncated disks. Tympanum distinct, ? diameter of eye. Parotoids present. Fingers webbed at base; first finger half the length of the second. Toes almost fully webbed. Skin of back tubercular with the largest tubercles in two rows on the sides of back. Colour brownish grey above with darker sides. A white band from below the eye to the shoulder and another on the flank. Below whitish spotted with black.

Distribution : Tamil Nadu, Kerala, Karnataka, Goa and Maharashtra (Dinesh *et al.*, 2009).

Elsewhere : Not known.

Note : In Karnataka this species is found to be common in Kudremukh National Park, Agumbe and Sharavathi Wildlife Sanctuary. Endemic to Western Ghats.

Family DICROGLOSSIDAE Anderson

Sub-Family DICROGLOSSINAE Anderson

Genus ***Euphlyctis*** Fitzinger

10. ***Euphlyctis aloysii*** Joshy, Alam, Kurabayashi, Sumida and Kuramoto, 2009
Aloysii pond frog

2009. *Euphlyctis aloysii* Joshy, Alam, Kurabayashi, Sumida and Kuramoto, *Alytes,* **26** (1-4), 97-116.

Material examined: 2 exs., WGRC/V/A/743, Keasruhalla, BWLS, Chikkamagaluru, 8.xi.2006.

Diagnosis: Small species of frog SVL ranging up to 45.2 mm, dorsum with four large elliptical dark markings; relative to SVL head smaller, hind

limbs shorter and eye lids wider. Head wider than long, snout slightly pointed; nostril nearer to tip of snout than to eye; loreal region concave, canthus rostralis blunt, tympanum large about 75% of the eye diameter. Supratympanic fold thin. Fingers free, first finger longer the second; subarticular tubercle moderate. Toe tip slightly pointed subarticular tubercle moderate, web nearly reaching toe tip and sharply incised. In life, dorsum light brown with thin greenish mid-dorsal stripe and green patches over upper jaw and from eyelid to shoulder; two pairs of rather conspicuous large elliptical markings on the dorsum.

Distribution : Known from Mangalore of Karnataka.

Elsewhere : nil.

Note : According to Joshi *et al.,* (2009) this is a cryptic species, sharing more of the morphological characters with *E. cyanophlyctis*. Endemic to Karnataka parts of Western Ghats.

11. ***Euphlyctis cyanophlyctis*** (Schneider, 1799) **Skittering Frog**

1799. *Rana cyanophlyetis* Schneider, *Hist. Amph. Nat.*: 137.

1801. *Bufo cyanophlyctis* - Latreille *In Sonnini de Manoncourt and Latreille, (An. X), Hist. Nat. Rept.*, **2**: 132.

1802. *Rana cyanophlyetis* - Shaw, *Gen. Zool.*, **3**(1): 111.

1802. *Bufo cyanoplyetis* - Daudin, *(An. XI), Hist. Nat. Rain. Gren. Crap., Quarto*: 103.

1803. *Bufo cyanophlyetis* - Daudin, *(An. XI), Hist. Nat. Gen. Part. Rept.*, **8**: 209.

1833. *Rana bengalensis* Gray, *Ill. Indian Zool.*

1841. *Rana leschenaultii* Dumeril and Bibron, *Erp. Gen.*, **8**: 342.

1853. *Rana benghalensis* - Kelaart, *Prodr. Faunae Zeylan., 1,* **1**: 192.

1860. *Dicroglossus adolfi* Gunther, *Proc. Zool. Soc. London, 1860*: 158.

1861. *Euphlyctis leschenaultii* - Fitzinger, "1860", *Sitzungsber. Akad. Wiss. Wien, Phys. Math. Naturwiss. Kl.*, **42**: 414.

1882. *Rana cyanophlictis* - Mason, *Burma, Ed.* **3**: 290.

1899. *Rana cyanophlyctis var. seistanica* Nikolskii, *Ann. Mus. Zool. Acad. Imp. Sci. St. Petersbourg*, **4**: 406.

1920. *Rana (Rana) cyanophlyctis* - Boulenger, *Rec. Indian Mus.*, **20**: 6.

1938. *Dicroglossus cyanophlyctis* - Deckert, Sitzungsber. *Ges. Naturforsch. Freunde Berlin, 1938*: 138.

1941. *Rana cyanophlyctis cyanophlyctis* - Parker, *Exped. SW Arabia 1937-1938, 1,* **1**: 5.

1950. *Rana (Rana) cyanophlictis* - Guibe, "1948", *Cat. Types Amph. Mus. Natl. Hist. Nat.*: 37.

1958. *Rana cyanophlictis variety fulvus* - De Silva, *Spolia Zeylan.*, **28**: 158.

1958. *Rana cyanophlictis variety flavens* - De Silva, *Spolia Zeylan.*, **28**: 158.

1974. *Rana (Dicroglossus) cyanophlyctis cyanophlytis* - Dubois, *Bull. Mus. Natl. Hist. Nat. Paris, Ser. 3, Zool.*, **213**: 376.

1981. *Rana (Euphlyctis) cyanophlyctis* - Dubois, *Monit. Zool. Ital., N.S., Suppl.*, **15**: 240.

1985. *Euphlyctis cyanophlyctis* - Poynton and Broadley, *Ann. Natal Mus.*, **27**: 124.

1987. *Occidozyga (Euphlyctis) cyanophlyctis* - Dubois, "1986", *Alytes*, **5**: 59.

1992. *Euphlyctis cyanophlyctis* - Dubois, *Bull. Mens. Soc. Linn. Lyon*, **61**: 315.

1997. *Euphlyctis cyanophlyctis cyanophlyctis* - Khan, *Pakistan J. Zool.*, **29**: 108.

1997. *Euphlyctis cyanophlyctis microspinulata* Khan, *Pakistan J. Zool.*, **29**: 108.

1997. *Euphlyctis cyanophlyctis seistanica* - Dutta, *Amph. India* Sri Lanka: 115.

Material examined: 8 exs., (ZSIA 10848), Kotigehara, Dist.- Chikmagalur, 27.xii.1960; 11 exs., (ZSIA 10822) Sagar, Dist.- Shimoga; 10.iii. 1965; 25 exs., (ZSIA 10821), Agumbe, Dist.- Shimoga, 16.iii.1965; 11 exs., (ZSIA 10833 & ZSIA 10841), Mercara, Sudarshan Guest House compound, Dist.-Kodagu, 1-4.iii.1966; 9 exs., (ZSIA 10849), Hassan, Dist.-Hassan, 3.xi.1969; 24 exs., (ZSIA 10847), Sakleshpur, Dist.-Hassan, 3-6. xii.1969; 1 ex., (ZSIA 10819), Tunga River, about 3 km. from T.B., Dist.- Chikmagalur, 14.xi.1969; 7 exs., (ZSIA 10846) Sringeri, Anagunda, Dist.- Chikmagahr, 15.xi.1969; 6 exs., (ZSIA 10845), 2 Km. east of T.B., Dist.- Chikmagahar, 16.xi.1969; 5 exs., (ZSIA 10818 & 10844), Sagar, about 8 Km. south west of T.B., Dist.- Shimoga, 20-21.xi.1969; 2 exs., (ZSIA 10840) Channapatna, Dist.- Hassan,

30.x.1969; 3 exs., (ZSIA 10820) Hatrae gate pump house, 8 Km. from FRH, Mudigere, Dist.- Kodagu, 11.xi.2003; 1 ex., (ZSIA 10690), in and around F.R.H Mudigere, Dist.- Kodagu, 12-xi-2003; 2 exs., (ZSIA10077 & 10078), Stream, Gundia, Dist.- Dakshin Kannada, 20-ix-2004; 2 exs., (ZSIA 10201 & 10202), Malandur, Agumbae, Dist.-Shimoga, 30-ix-2004; 2 exs., (ZSIA 10910), FRH Belgaum, Dist.- Belgaum, 21-viii-2005; 1 ex., WGRC/V/A/744, Keasruhalla, BWLS, Chikkamagaluru, 8.xi.2006; 2 exs., WGRC/V/A/745, Halagekerae, BWLS, Chikkamagaluru, 15.xi.2007; 1 ex, WGRC/V/A/746, Thegadagudda, BWLS,m Chikkamagaluru, 19.xi.2007; 2 exs., WGRC/V/A/747, Bhadra damsite, BWLS, Chikkamagaluru, 7.xi.2006; 1 ex., WGRC/V/A/118, Hosahuthikera, Coorg, 11.i.1995; 1 ex., WGRC/V/A/131, Lakshmanathirtha, Coorg, 23.i.1985; 2 exs., WGRC/V/A/581, Bagavathi forest, Chickmagalur, 26.x.05; 3 exs., WGRC/V/A/591, Keraekattae, Chickmagalur, 18.x.2005; 2 exs., WGRC/V/A/659, Chowdikattae, BWLS, Chickmagalur, 06.xi.2006; 2 exs., WGRC/V/A/731, Madla, BWLS, Chikkamagaluru, 15.xi.2007.

Diagnosis: Medium sized frogs. Snout rounded. First and second fingers more or less equal in length. Tibiotarsal articulation reaches up to either between the tympanum and eye or eye and nostril when the leg is held along the side of the body. Toe tips swollen and rounded, but without disks. A single line of porous warts on flanks, from behind the shoulder to the groin. Inner metatarsal tubercle fingerlike. Skin on dorsum warty. A strong fold from behind the eye to the shoulder. A U-shaped line of warts above the anus. Ventrally smooth. Dorsum grey olive, brown with darker spots or marblings. Back of the thighs with a dark-edged white band. Ventrally white, often spotted, vermiculated or marbled with black. The black colouration on the belly is commoner and more widespread in the larger females.

Distribution : Throughout India (Dutta, 1997).

Elsewhere : Iran, Pakistan, Nepal, Afghanistan, Sri Lanka, Malaysia, and Vietnam (Frost, 2010).

12. ***Euphlyctis hexadactylus*** (Lesson, 1834)
Indian Pond Frog

1834. *Rana hexadactyla* Lesson, *In Belanger (ed.), Voy. Indes-Orientales N. Eur. Caucase Georgie Perse, Zool.*: 331.

1841. *Dactylethra bengalensis* Dumeril and Bibron, *Erp. Gen.*, **8**: 339.

1841. *Rana cutipora* Dumeril and Bibron, *Erp. Gen.*, **8**: 338.

1841. *Rana saparoua* Dumeril and Bibron, *Erp. Gen.*, **8**: 338.

1855. *Rana robusta* Blyth, "1854", *J. Asiat. Soc. Bengal*, **23**: 298.

1861. *Phrynoderma cutiporum* - Fitzinger, "1860", *Sitzungsber. Akad. Wiss. Wien, Phys. Math. Naturwiss. Kl.*, **42**: 414.

1920. *Rana (Rana) hexadactyla* - Boulenger, *Rec. Indian Mus.*, **20**: 5.

1974. *Rana (Dicroglossus) hexadactyla* - Dubois, *Bull. Mus. Natl. Hist. Nat. Paris, Ser. 3, Zool.*, **213**: 341-411.

1981. *Rana (Euphlyctis) hexadactyla* - Dubois, *Monit. Zool. Ital., N.S., Suppl.*, **15**: 240.

1985. *Euphlyctis hexadactyla* - Poynton and Broadley, *Ann. Natal Mus.*, **27**: 124.

1987. *Occidozyga (Euphlyctis) hexadactyla* - Dubois, "1986", *Alytes*, **5**: 59.

1992. *Euphlyctis hexadactylus* - Dubois, *Bull. Mens. Soc. Linn. Lyon*, **61**: 315.

Material examined: 1 ex., (ZSIA 10803), Suratkal, 24 Km. away from Municipal Travelers Bunglow, Pandeshwar, Dakshin Kannada, 7.i.1976; 1 ex., (ZSIA 9084), Luckunda Estate, Virajpet, Dist.- Srimangalanadu, Coorge, 11- viii-1998.

Diagnosis: Dorsum leaf-green or darker with porous warts, venter dull whitish; ventral surface more or less granulated with throat, under surface of thighs and sides of belly; head as long as broad; or a little broader than long, snout rounded or slightly pointed, hardly projecting beyond mouth, longer than diameter of eye; nostril nearer tip of snout than eye. Fingers free, first longer than second, tips pointed, sub-articular tubercles of fingers or toes feeble; toes fully webbed, tips pointed, digit like metatarsal tubercle present; outer meta tarsal tubercle absent. Tibiotarsal articulation reaching between posterior of tympanum and anterior corner of eye.

*Distribution :*Throughout India (Dutta, 1997).

Elsewhere : Bangladesh, Pakistan and Sri Lanka (Frost, 2010).

13. ***Euphlyctis mudigere*** Joshy, Alam, Kurabayashi, Sumida and Kuramoto, 2009

Mudigere pond frog

2009. *Euphlyctis mudigere* Joshy, Alam, Kurabayashi, Sumida and Kuramoto, *Alytes*, **26** (1-4), 97-116.

Material examined: 1 ex., (ZSIA 10077), stream, Gundia, Dist: Dakshin Kannada, 20.ix.2004.

Diagnosis: Dorsum dark brown with indistinct small patches. Irregular markings on the upper side of hindlimb; a conspicuous white band on posterior side of thigh, accompanied with a thin black stripe on ventro-posterior side, underside immaculate, vocal sacs light gray. Vomerine teeth round, situated near anterior end of upper jaw; tongue tip bifurcated. Head small wider than long; snout slightly pointed, nostril nearer to the eye than to tip of the snout. Loreal region concave, canthus rostralis blunt; internarial distance larger than inter orbital. Tympanum large, about 85% diameter of the eye. Fingers free, gradually tapering to pointed tip, first finger larger than second; toes fully webbed, inner metatarsal tubercle indistinct; sub-articular tubercle small; tibiotarsal articulation slightly apart when legs folded at right angle to the body.

Distribution: Known from Mudigere, Chikkamagaluru of Karnataka.

Elsewhere : nil.

Note : According to Joshi *et al.,* (2009) this is a cryptic species, sharing more of the morphological characters with *E. hexadactylus*. Endemic to Karnataka parts of Western Ghats.

Genus ***Fejervarya*** Bolkay

14. ***Fejervarya caperata*** Kuramoto, Joshy, Kurabayashi and Sumida, 2007

Mudigere pond frog

2007. *Fejervarya caperata* Kuramoto, Joshy, Kurabayashi and Sumida, *Current Herpetology* **26**(2): 81-105.

Material examined: 4 exs., WGRC/V/A/737, Hipla camp, Chikkamagaluru, 12.xi.2006; 3 exs., WGRC/V/A/742, Talabidri, BWLS, Chikkamagaluru, 16.xi.2007; 3 exs., WGRC/V/A/749, Shirgola, Chikkamagaluru, 17.xi.2007; 2 exs., WGRC/V/A/751, Kavalapura, BWLS, Chikkamagaluru, 20.xi.2007; 1 ex., WGRC/V/A/752, Mullayanagiri, BWLS, Chikkamagaluru, 15.viii.2007; 1 ex., WGRC/V/A/754, Tadabehalla, BWLS, Chikkamagaluru, 11.xi.2006; 1 ex., WGRC/V/A/756, Virupakshikhan, Chikkamagaluru, 5.iii.2009.

Diagnosis: A small species of frog, head slightly wider than long, snout slightly pointed, loreal region heavily concave, canthus rostralis rounded, nostril nearer to tip of snout than to eye, tympanum about 60% of eye in diameter. Fingers free, tip rounded, subarticular and palmar tubercles distinct. Hindlimbs relatively short, tibia longer than femur, toe tip rounded, subarticular tubercle moderate. Snout and upper eyelid smooth; dorsum with many longitudinal ridges roughly forming four longitudinal series, mid-dorsal stripe present.

Distribution : Mangalore and Madikeri (Karnataka).

Elsewhere : Not known.

Note : According to Kuramoto *et al.,* (2007) this species belongs to earlier assemblage of *Fejervarya limnocharis* - cryptic taxa; *F. caperata*, *F. granosa*, *F. kudremukhensis* and *F. mudduraja* are regarded as cryptic species that are difficult to identify by morphological traits alone (Kuramoto *et al.,* 2007). Endemic to Western Ghats parts of Karnataka.

15. ***Fejervarya granosa*** Kuramoto, Joshy, Kurabayashi and Sumida, 2007

Granular fejervarya

2007. *Fejervarya granosa* Kuramoto, Joshy, Kurabayashi and Sumida, *Current Herpetology* **26**(2): 81-105.

Material examined: 2 exs., WGRC/V/A/729, Halagekerae, BWLS, Chikkamagaluru, 15.xi.2007; 2 exs., WGRC/V/A/732, Halasinakhan, Chikkamagaluru, 14.xi.2006,; 4 exs., WGRC/V/A/734, Kadubailu, BWLS, Chikkamagaluru, 13.xi.2006; 7 exs., WGRC/V/A/736, Keasruhalla, BWLS, Chikkamagaluru, 8.xi.2006; 2 exs., WGRC/V/A/738, Hipla camp, Chikkamagaluru, 12.xi.2006;

2 exs., WGRC/V/A/748, Shirgola, Chikkamagaluru, 17.xi.2007; 2 exs., WGRC/V/A/753, Kavalapura, BWLS, Chikkamagaluru, 20.xi.2007; 1 ex., WGRC/V/A/755, Tadabehalla, BWLS, Chikkamagaluru, 11.xi.2006; 1 ex., WGRC/V/A/757, Virupakshikhan, Chikkamagaluru, 5.iii.2009; 1 ex., WGRC/V/A/758, Sukhalhatti, BWLS, Chikkamagaluru, 4.xi.2006; 9 exs., WGRC/V/A/760, Chowdikattae, BWLS, Chikkamagaluru, 6.xi.2006.

Diagnosis: A small species of frog, head wider than long, snout, moderately pointed, loreal region concave , canthus rostralis blunt, nostril slightly nearer to tip of snout than to eye, tympanum distinct, about 55% of eye in diameter. Finger tip rounded, subarticular tubercle well developed. Hindlimbs moderately long, tibia longer than femur. Dorsum with large rounded or elliptical ridges interrupted inverse V-shaped ridge on the middle of dorsum at the level of forelimb.

Distribution: Chickmagalur and Madikeri (Karnataka).

Elsewhere : Not known.

Note : According to Kuramoto *et al.,* (2007) this species belongs to earlier assemblage of *Fejervarya limnocharis* - cryptic taxa; *F. caperata*, *F. granosa*, *F. kudremukhensis* and *F. mudduraja* are regarded as cryptic species that are difficult to identify by morphological traits alone (Kuramoto *et al.,* 2007). Endemic to Western Ghats parts of Karnataka.

16. ***Fejervarya keralensis*** (Dubois, 1980)
Kerala Warty Frog

1876. *Rana verrucosa* Gunther, "1875", *Proc. Zool. Soc. London, 1875*: 567.

1920. *Rana (Rana) verrucosa* - Boulenger, *Rec. Indian Mus.*, **20**: 6.

1938. *Dicroglossus verrucosus* - Deckert, *Sitzungsber. Ges. Naturforsch. Freunde Berlin, 1938*: 138.

1981. *Rana (Euphlyctis) keralensis* Dubois, "1980", *Bull. Mus. Natl. Hist. Nat. Paris, Ser. 4(A)*, **2**: 928.

1984. *Rana (Fejervarya) keralensis* - Dubois, *Alytes*, **3**: 148.

1985. *Euphlyctis keralensis* - Poynton and Broadley, *Ann. Natal Mus.*, **27**: 124.

1987. *Limnonectes (Fejervarya) keralensis* - Dubois, "1986", *Alytes*, **5**: 61.

1998. *Fejervarya keralensis* - Iskandar, *Amph. Java Bali*: 71.

Material examined: 4 exs., (ZSIA 10834), Mercana, Sudershan Guest House compound, Dist.-Kodagu, 1.iii.1966; 1 ex., (ZSIA 10827), Cherambane, 30 Km. away from F.R.H Talekaveri, Dist.- Kodagu, 15.xi.2003; 2 exs., (ZSIA 10887 & 10888) Hatrae gate pump house, 8 Km. from FRH Medikeri, Dist.-Kodagu, 11.xi.2003; 1 ex., (ZSIA 10942) Chitradurga, Dist.- Chitradurga, 26-viii-2005; 1 ex., (ZSIA 10943) Bemanholai hill, 6 Km. from Subramanya, Dist.-Dakshina Kannada, 24.xi.2003; 2 exs., WGRC/V/A/593, Manikyadhara Betta, Kudremukh National Park, Chickmagalur, 19.x.2005.

Diagnosis: Medium sized frogs. Snout obtuse, tympanum distinct, nearly the size of the eye. First finger longer than the second. Tibiotarsal articulation reaches nostril or tip of snout; heels strongly overlap when folded at right angle to the body. Toes fully webbed except the fourth which has two phalanges free. A dermal fringe to the fifth toe. Outer metatarsals separated nearly to the base. Two metatarsal tubercles, the inner larger. A short tarsal fold. The skin of the back is extremely warty. A fold from eye to shoulder. Ventrally smooth. Dark grey or brown above with dark markings. A light vertebral streak if present, interrupted by the markings on the back. Limbs and lips barred. Sides of the thigh patterned in black and yellow. Ventrally white.

Distribution: Gujarat (doubtful), Goa, Karnataka, Kerala, Tamil Nadu (Biju, 2001) and Orissa.

Elsewhere : Nepal (doubtful) (Frost, 2010).

17. ***Fejervarya kudremukhensis*** Kuramoto, Joshy, Kurabayashi and Sumida, 2007*
Kudremukh fejervarya

2007. *Fejervarya kudremukhensis* Kuramoto, Joshy, Kurabayashi and Sumida, *Current Herpetology*, **26**(2): 81-105.

Diagnosis: A large fejerveryan frog with few and small dermal ridges on the dorsum. Head wider

than long; snout moderately pointed; loreal region concave; canthus rostralis blunt; nostrils equidistant from tip of snout and from eye; tympanum about half the diameter of the eye. Fingers free with rounded tip; subarticular and palmar tubercle well developed. Hindlimb relatively long; tibia longer than femur; toe tip rounded; inner metatarsal tubercle relatively large; outer metatarsal tubercle small; webbing half.

Distribution: Chickmagalur and Madikeri (Karnataka).

Elsewhere : Not known.

Note : According to Kuramoto *et al.,* (2007) this species belongs to earlier assemblage of *Fejervarya limnocharis* - cryptic taxa; *F. caperata*, *F. granosa*, *F. kudremukhensis* and *F. mudduraja* are regarded as cryptic species that are difficult to identify by morphological traits alone (Kuramoto *et al.,* 2007). Endemic to Western Ghats parts of Karnataka.

18. ***Fejervarya mudduraja*** Kuramoto, Joshy, Kurabayashi and Sumida, 2007*
Muddu Raja fejervarya

2007. *Fejervarya mudduraja* Kuramoto, Joshy, Kurabayashi and Sumida, *Current Herpetology,* **26**(2): 81-105.

Diagnosis: A large sized fejervarya with relatively long longitudinal ridges that tend to arrange in to four rows on the dorsum. Head wider than long, snout more or less pointed from above; loreal region strongly concave; canthus rostralis not sharp, nostril nearer to snout than to eye. Fingers free; finger tip rounded; subarticular and palmar tubercle well developed. Tibia longer than femur; toe tip rounded; subarticular tubercles moderate; inner metatarsal tubercle long and laterally compressed; outer metatarsal tubercle small; webbing half.

Distribution: Chickmagalur and Madikeri (Karnataka).

Elsewhere : Not known.

Note : According to Kuramoto *et al.,* (2007) this species belongs to earlier assemblage of *Fejervarya limnocharis* - cryptic taxa; *F. caperata*, *F. granosa*, *F. kudremukhensis* and *F. mudduraja* are regarded as cryptic species that are difficult to identify by morphological traits alone (Kuramoto *et al.,* 2007). Endemic to Western Ghats parts of Karnataka.

19. ***Fejervarya mysorensis*** (Rao, 1922)*
Mysore frog

1922. *Rana (Rana) limnocharis mysorensis* Rao, J. *Nat. Hist. Soc. Bombay*, **28**: 439-447.

1985. *Euphlyctis limnocharis mysorensis* - Poynton and Broadley, *Ann. Natal Mus.*, **27**: 124.

1996. *Limnonectes mysorensis* - Dutta and Singh, *Zoo's Print*, **11**: 15.

1998. *Fejervarya mysorensis* - Iskandar, *Amph. Java Bali*: 71.

Diagnosis: Olive brown or a green above with a distinct narrow or broad yellow vertebral band; the upper surface is blotched; a V shaped dark band between the eyes; abdomen is yellow. Throat and chest beautifully marbled or powdered black. Upper part of skin with longitudinal cutaneous folds from behind the head, sides with warty tubercles, sometimes tipped with cornified minute spines. Head as long as broad, moderately depressed; snout pointed, slightly projecting beyond the mouth, longer than the diameter of the eye. Nostril nearer to the tip of the snout. Tympanum distinct, ½ to 3/8 the diameter of the eye and nearly twice its distance from the latter. Fingers blunt, long and slender. First longer than second, third as long as or a little longer than snout. Hindlimbs long, Tibiotarsal articulation reaching nearly the tip of the snout, heels very broadly overlap when the limbs are folded at right angle to the body.

Distribution: Known from type locality only.

Elsewhere : Not known.

Note : Type of this species is found to be lost and it needs type designation from the type locality. Endemic to Karnataka parts of Western Ghats.

20. ***Fejervarya rufescens*** (Jerdon, 1853)*
Reddish Burrowing Frog

1854. *Pyxicephalus rufescens* Jerdon, "1853", *J. Asiat. Soc. Bengal*, **22**: 534.

1882. *Rana rufescens* - Boulenger, *Cat. Batr. Sal. Coll. Brit. Mus., Ed.* **2**: 29.

1920. *Rana (Tomopterna) rufescens* - Boulenger, *Rec. Indian Mus.*, **20**: 102.

1984. *Rana (Fejervarya) rufescens* - Dubois, *Alytes*, **3**: 149.

1987. *Limnonectes (Fejervarya) rufescens* - Dubois, "1986", *Alytes*, **5**: 61.

1998. *Tomopterna rufescens* - Das and Dutta, *Hamadryad*, **23**: 66.

1998. *Fejervarya rufescens* - Iskandar, *Amph. Java Bali*: 71.

Diagnosis: Medium sized frogs. Head broader than long with rounded snout. Tympanum distinct, about half or slightly over half the diameter of the eye. First finger much longer than second, third equal to or slightly longer than the first. Tibiotarsal articulation reaches tympanum or posterior border of the eye. Heels overlap when legs are folded at right angles to the body. Toes feebly webbed. One phalange of 1st and 2nd toes free; 2 phalanges of 3rd and 5th toes and 3 phalanges of 4th toe free. Subarticular tubercles of fingers and toes prominent. Inner metatarsal tubercle large, nearly one third the length of the inner toe and is compressed and crescentic in shape. Outer metatarsal tubercle small. Skin with numerous warts above and two glandular ridges forming an inverted open V between the shoulders. A glandular fold from the eye to shoulder, present. Ventrally smooth except on the back of the thighs where it is granular. Brown above with darker spots and marblings. Occasionally a crossbar between eyes. Lips and limbs barred. Most specimens with patches of varying shades of red and some with whole dorsal surface brick red.

Distribution: Maharashtra, Karnataka and Kerala (Biju, 2001).

Elsewhere : Not known.

Note : Endemic to Western Ghats.

21. ***Fejervarya sauriceps*** (Rao, 1937)*
Mysore Wart Frog

1937. *Rana (Hylorana) sauriceps* Rao, *Proc. Indian Acad. Sci., Ser. B*, **6**: 396.

1984. *Rana (Fejervarya) sauriceps* - Dubois, *Alytes*, **3**: 155.

1987. *Limnonectes (Fejervarya) sauriceps* - Dubois, "1986", *Alytes*, **5**: 61.

1998. *Fejervarya sauriceps* - Iskandar, *Amph. Java Bali*: 71.

Diagnosis: Dorsum chocolate red, sides darker. Throat and chest yellowish; abdomen brown and underside of the thighs orange. Limbs faintly barred. Dorsal skin slightly granulate with short interrupted longitudinal folds. Ventral skin almost smooth. Head longer than broad; snout pointed and projecting beyond the mouth. Tympanum distinct and slightly smaller than eye. Forelimbs moderate in size, fingers moderately long, obtusely pointed and without discs. Hindlimbs rather long and slender. Tibiotarsal articulation reaching nostril. Toes pointed and partly webbed. Subarticular tubercles small and inconspicuous. Both inner and outer metatarsal tubercle present.

Distribution: Known from type locality only.

Elsewhere : Not known.

Note : Type of this species is found to be lost and it needs type designation from the type locality. Endemic to Karnataka parts of Western Ghats.

Genus ***Hoplobatrachus*** Peters

22. ***Hoplobatrachus crassus*** (Jerdon, 1854)
Jerdon's Bull Frog

1854. *Rana crassa* Jerdon, "1853", *J. Asiat. Soc. Bengal*, **22**: 531.

1863. *Hoplobatrachus ceylanicus* Peters, *Monatsber. Preuss. Akad. Wiss. Berlin, 1863*: 445-470.

1872. *Rana (Hoplobatrachus) ceylanicus* - Gunther, *Ann. Mag. Nat. Hist., Ser. 4*, **9**: 85.

1892. *Rana tigrina var. ceylanica* - Boettger, *Ber. Offenbach. Ver. Naturkd., 1892*: 94.

1918. *Rana tigrina var. crassa* - Boulenger, *Rec. Indian Mus.*, **15**: 51-58.

1918. *Rana crassa* - Annandale, *Rec. Indian Mus.*, **15**: 61.

1942. *Rana tigrina crassa* - Bourret, *Batr. Indochine*: 241.

1974. *Rana (Dicroglossus) crassa* - Dubois, *Bull. Mus. Natl. Hist. Nat. Paris, Ser. 3, Zool.*, **213**: 378-380.

1987. *Limnonectes (Hoplobatrachus) crassus* - Dubois, "1986", *Alytes*, **5**: 60.

1992. *Hoplobatrachus crassus* - Dubois, *Bull. Mens. Soc. Linn. Lyon*, **61**: 315.

Material examined: 1 ex., (ZSIA 10895), Shiggam, 40 Km. from Haveri, Dist: Haveri, 29.VIII.2005.

Diagnosis: Head a little broader than long; snout generally pointed, projecting beyond the mouth; longer than the diameter of the eye. Nostril generally equidistant from the tip of the snout and the eye. Inter-orbital width much smaller than that of upper eyelid. Tympanum distinct, nearly equal to the diameter of the eye. Fingers free; first longer than second; sub-articular tubercles of fingers and toes freely distinct. Toes entirely webbed, penultimate phalange of fourth toe free, tips not pointed; a highly developed, shovel shaped inner metatarsal tubercle present, outer metatarsal tubercle absent. Tibiotarsal articulation reaches the tympanum of the eye. The heels do not overlap, when the limbs are folded at right angle to the body. Dorsum light grayish with interrupted long warts. Venter dull whitish with darker spots on throat and smooth.

Distribution: West Bengal, Assam, Uttar Pradesh, Madhya Pradesh, Orissa, Andhra Pradesh, Karnataka, Kerala and Tamil Nadu (Dutta, 1997).

Elsewhere : Nepal, Bangladesh and Sri Lanka (Frost, 2010).

23. ***Hoplobatrachus tigerinus*** (Daudin, 1802)
Indian Bull Frog

1758. *Rana typhonia* Linnaeus, *Syst. Nat., Ed. 10*, **1**: 211.

1799. *Bufo typhonius* - Schneider, *Hist. Amph. Nat.*: 207.

1802. *Rana tigerina* Daudin, *(An. XI), Hist. Nat. Rain. Gren. Crap., Quarto*: 62.

1820. *Rana tigrina* - Merrem, *Tent. Syst. Amph.*: 174.

1829. *Rana picta* Gravenhorst, *Delic. Mus. Zool. Vratislav.*, **1**: 39.

1838. *Osilophus typhonius* - Tschudi, *Classif. Batr.*: **52**: 89.

1841. *Cystignathus typhonius* - Dumeril and Bibron, *Erp. Gen.*, **8**: 402.

1843. *Leptodactylus typhonius* - Fitzinger, *Syst. Rept.*: 31.

1853. *Rana malabarica* Kelaart, *Prodr. Faunae Zeylan., 1*, **1**: 191.

1870. *Rana gracilis var. pulla* Stoliczka, *J. Asiat. Soc. Bengal*, **39**: 139.

1871. *Otilophus typhonius* - Peters, *Monatsber. Preuss. Akad. Wiss. Berlin, 1871*: 403.

1875. *Oxyrhynchus typhonius* - Jimenez de la Espada, *Vert. Viaje Pacif. Verif. 1862-1865*: 178.

1875. *Oxyrhynchus typhonius* - Jimenez de la Espada, *Vert. Viaje Pacif. Verif. 1862-1865*: 178.

1882. *Leptodactylus typhonius* - Boulenger, *Cat. Batr. Sal. Coll. Brit. Mus., Ed.* **2**: 246.

1912. *Rana tigerina* - Barbour, *Mem. Mus. Comp. Zool.*, **44**: 63.

1915. *Rana (Fejervarya) tigrina* - Bolkay, *Anat. Anz.*, **48**: 175.

1920. *Rana (Rana) tigrina* - Boulenger, *Rec. Indian Mus.*, **20**: 6.

1933. *Bufo typhonius typhonius* - Leavitt, *Copeia*, **1933**: 8.

1938. *Dicroglossus tigrinus* - Deckert, *Sitzungsber. Ges. Naturforsch. Freunde Berlin, 1938*: 138.

1940. *Rana tigrina tigrina* - Smith, *Rec. Indian Mus.*, **42**: 465-486.

1953. *Bufo (Otylophus) typhonius* - Cei, *Arch. Zool. Ital. Torino*, **38**: 511.

1969. *Rana tigerina tigerina* - Mertens, *Stuttgart. Beit. Naturkd.*, **197**: 17.

1974. *Rana (Dicroglossus) tigerina tigerina* - Dubois, *Bull. Mus. Natl. Hist. Nat. Paris, Ser. 3, Zool.*, **213**: 341-411.

1981. *Rana (Euphlyctis) tigerina* - Dubois, *Monit. Zool. Ital., N.S.*, Suppl., **15**: 239.

1985. *Euphlyctis tigerina* - Poynton and Broadley, *Ann. Natal Mus.*, **27**: 124.

1987. *Limnonectes (Hoplobatrachus) tigerinus* - Dubois, "1986", *Alytes*, **5**: 59.

1991. *Tigrina tigrina* - Fei, Ye, and Huang, "1990", *Key to Chinese Amph*: 144.

1992. *Hoplobatrachus tigerinus* - Dubois, *Bull. Mens. Soc. Linn. Lyon*, **61**: 315.

Material examined: 1 ex., (ZSIA 10838), Penambur Sea beach, Mangalore, Dist.- Dakshin Kannada, 19.xii.1966; 1 ex., (ZSIA 10826), Condapur, Dist.- Udipi, 31. xii. 1966; 3 exs., (ZSIA 10016, 10022 & 10023), Hemavathi river, Shakelshpur Dist.,15-ix-2004 & 16-xi-2004; 2 exs., (ZSIA 10198 & 10199), Malandur, Ajumbe, Dist.- Shimoga, 30-ix-2004; 1 ex., (ZSIA 10193), Ballae halli Reserve forest Agumbe, Dist: Shimoga; 30.ix.2004; 1 ex., (ZSIA 10604), Shiggan, 40 Km. from, Haveri camp. Dist- Haveri, 29.viii.2005; 1 ex., (ZSIA 10892), Chitradurga, 2005; 1 ex., WGRC/V/A/580, Keraekattae, Chickmagalur, 20.10.05; 1

ex., WGRC/V/A/586, Manikyadhara Betta, Kudremukh National Park, Chickmagalur, 19.10.05; 1 ex., WGRC/V/A/656, Sukhalhatti, BWLS, Chickmagalur, 04.xi.2006.

Diagnosis: Large sized frogs, males smaller compared to females. Snout projecting beyond mouth. Tympanum distinct, equal to or slightly smaller than the diameter of the eye. First finger longer than second. Toes fully webbed but the web not reaching the tip of the fourth toe. Fifth toe with an outer fringe of web. Outer metatarsals separated by web nearly to the base. An obtuse inner metatarsal tubercle. Tibiotarsal articulation reaches the eye or between the eye and the nostril. Heels overlap when folded at right angles to the body. Skin smooth or granulate above with distinct longitudinal glandular folds. A fold from behind the eye to the shoulder. Ventral skin smooth. Dorsum olive green or brown with darker markings. A light colored vertebral streak from snout to vent often present.

Distribution: Throughout India (Dutta, 1997).

Elsewhere : Nepal, Bhutan, Pakistan, and Sri Lanka (Frost, 2010).

Genus ***Minervarya*** Dubois, Ohler and Biju

24. ***Minervarya sahyadris*** Dubois, Ohler and Biju, 2001

Minervarya frog

2001. *Minervarya sahyadris* Dubois, Ohler, and Biju, *Alytes*, **19**: 58.

2007. *Fejervarya sahyadris* - Matsui, Joshy, Kurabayashi, and Sumida, *Curr. Herpetol.*, **26**: 98-99.

2009. *Minervarya sahyadris* - Ohler, Deuti, Grosjean, Paul, Ayyaswamy, Ahmed and Dutta, *Zootaxa,* **2209**: 43-56.

Material examined: 6 exs., (ZSIA 10050, 10051, 10052, 10062, 10066, & ZSIA10068), Stream, Gundia, Dist.- Dakshin Kannada, 18.ix.2004 & 20.ix.2004; 2 exs., (ZSIA 10903) Mannagunddy, 15 Km. south to Gundia FRH, Dist: Dakshin Kannada, 21.ix.2003; 6 exs., (ZSIA 10098, 10099, 10110, 10111, 10112 & ZSIA 10113), springs, Giriguddhai, Dist.- Dakshin Kannada, 22.ix.2004; 1 ex., (ZSIA 10135), Plantation, Giriguddhai, Dist.- Dakshin Kannada, 22.ix.2004; 4 exs., (ZSIA 10882), Gundia river, Dist.- Dakshin Kannada, 23.xi.2003; 7 exs., WGRC/V/A/609, Hipla camp, Chickmagalur, 12.xi.2006.

Diagnosis: A small frog with fejerveryan lines on both sides of the belly in life; possessing a rictal gland at the mouth commissure, prominent in life; distinct canthus rostralis; nostrils near to snout tip than to eye; a white horizontal band along the upper lip in life; vomerine teeth present; median lingual process absent; digital extremities rounded, not dilated; webbing rudimentary; inner metatarsal tubercle short, conical; outer metatarsal tubercle present, minute; tarsal ridge present; heels strongly overlapping when folded at right angles to each other; tibiotarsal articulation reaching up to posterior corner of eye. Dorsal skin with longitudinal folds; pupil horizontal and oval, iris golden yellow; sides of head brownish, darker in tympanic region; mid dorsum brown to brick red; upper arm brick red; upper lip white colored; venter yellowish white.

Distribution: Karnataka and Kerala.

Elsewhere : Not known.

Note : Endemic to Western Ghats.

Genus ***Sphaerotheca*** Gunther

25. ***Sphaerotheca breviceps*** (Schneider, 1799)

Indian Burrowing frog

1799. *Rana breviceps* Schneider, *Hist. Amph. Nat.*: 140.

1829. *Rana variegata* Gravenhorst, *Delic. Mus. Zool. Vratislav.*, **1**: 33.

1838. *Systoma breviceps* - Tschudi, *Classif. Batr.*: 86.

1854. *Pyxicephalus fodiens* Jerdon, "1853", *J. Asiat. Soc. Bengal*, **22**: 534.

1854. *Pyxicephalus pluvialis* Jerdon, "1853", *J. Asiat. Soc. Bengal*, **22**: 534.

1859. *Sphaerotheca strigata* Günther, "1858", *Cat. Batr. Sal. Coll. Brit. Mus.*: 20.

1860. *Pyxicephalus (Tomopterna) fodiens* - Peters, *Monatsber. Preuss. Akad. Wiss. Berlin, 1860*: 186.

1860. *Tomopterna strigata* - Gunther, *Proc. Zool. Soc. London, 1860*: 165.

1864. *Pyxicephalus breviceps* - Gunther, *Rept. Brit. India*: 411.

1920. *Rana (Tomopterna) breviceps* - Boulenger, *Rec. Indian Mus.*, **20**: 102.

1938. *Tomopterna breviceps* - Deckert, *Sitzungsber. Ges. Naturforsch. Freunde Berlin, 1938*: 142.

1956. *Rana swani* Myers and Leviton *In Leviton, Myers, and Swan, Occas. Pap. Nat. Hist. Mus. Stanford Univ.*, **1**: 7.

1976. *Tomopterna swani* - Dubois, *Cah. Nepal., Doc.*, **6**: 12.

1981. *Rana (Tomopterna) swani* - Dubois, *Monit. Zool. Ital., N.S., Suppl.*, **15**: 233.

1983. *Rana (Tomopterna) breviceps breviceps* - Dubois, *Alytes*, **2**: 166.

1987. *Tomopterna (Sphaerotheca) breviceps* - Dubois, "1986", *Alytes*, **5**: 57.

1987. *Tomopterna (Sphaerotheca) swani* - Dubois, "1986", *Alytes*, **5**: 57.

1998. *Tomopterna maskeyi* Schleich and Anders, *In Schleich and Kästle, Contr. Herpetol. S. Asia Nepal India*, **4**: 57.

1999. *Sphaerotheca breviceps* - Dubois, *J. South Asian Nat. Hist.*, **4**: 8.

2000. *Sphaerotheca pluvialis* - Marmayou, Dubois, Ohler, Pasquet, and Tillier, *C. R. Acad. Sci., Ser. 3, Paris*, **323**: 293.

2000. *Sphaerotheca swani* - Vences, Glaw, Kosuch, Das, and Veith, Lourenco and Goodman (eds.), *Diversite et Endeemisme a Madagascar*: 232.

2000. *Sphaerotheca maskeyi* - Vences, Glaw, Kosuch, Das, and Veith, Lourenco and Goodman (eds.), *Diversite et Endeemisme a Madagascar*: 232.

Material examined: 5 exs., (ZSIA 10894), Manur, 35 Km. from Haveri, Dist-Haveri, 28.viii.2005; 4 exs., (ZSIA 10606), Ranibenner. 35 km. from Haveri, Dist.- Haveri, 30.viii.2005; *Material examined:* 1 ex., WGRC/V/A/762, Kadubailu, BWLS, Chikkamagaluru, 13.xi.2006.

Diagnosis: Medium sized frog, snout less than the diameter of the eye in length, rounded, tympanum distinct. First finger considerably longer than second. Tibiotarsal articulation reaches the shoulder. Heels do not meet when the legs are folded at right angles to the boy. Sub-articulate tubercles prominent, inner metatarsal tubercle large compressed, crescentic and more than the inner toe in length.

Distribution : Punjab, Orissa, West Bengal, Rajasthan, Tamil Nadu, Kerala, Maharashtra and Karnataka (Dutta, 1997 and Biju, 2001).

Elsewhere : Pakistan, Nepal, Myanmar and Sri Lanka (Frost, 2010).

26. *Sphaerotheca dobsonii* (Boulenger, 1882)*
Dobson's Burrowing Frog

1882. *Rana dobsoni* Boulenger, *Cat. Batr. Sal. Coll. Brit. Mus., Ed.* **2**: 32.

1920. *Rana (Tomopterna) dobsonii* - Boulenger, *Rec. Indian Mus.*, **20**: 101-102.

1938. *Tomopterna dobsonii* - Deckert, *Sitzungsber. Ges. Naturforsch. Freunde Berlin, 1938*: 139.

2000. *Sphaerotheca dobsonii* - Dubois and Ohler, *Alytes*, **18**: 35.

Diagnosis: Dorsum gray, indistinctly marbled with brown; Dorsal smooth, granulate on the belly. Ventrum yellowish. A fold from eye to shoulder. Head large, snout short, rounded, inter-orbital width broader than that of upper eyelids. Tympanum very distinct and three-fourths diameter of the eye. Thighs black above marbled with white; beneath yellowish; throat brown spotted. First finger much longer than second as long as third. Toes moderately long and webbed at the base, sub-articular tubercles moderately prominent. A shovel shaped inner metatarsal tubercle absent. Tibiotarsal articulation reaching the shoulder or the tympanum.

Distribution : Orissa, Andhra Pradesh, Karnataka, and Tamil Nadu (Dutta, 1997).

Elsewhere : Not known.

Note : Endemic to Western Ghats.

27. *Sphaerotheca leucorhynchus* (Rao, 1937)
Rao's Burrowing Frog

1937. *Rana (Tomopterna) leucorhynchus* Rao, *Proc. Indian Acad. Sci., Ser. B*, **6**: 392.

1981. *Rana (Tomopterna) leucorhynchus* - Dubois, *Monit. Zool. Ital., N.S., Suppl.*, **15**: 233.

1987. *Tomopterna (Sphaerotheca) leucorhynchus* - Dubois, "1986", *Alytes*, **5**: 57.

2000. *Sphaerotheca leuchorhynchus* - Vences, Glaw, Kosuch, Das, and Veith, Lourenço and Goodman (eds.), *Diversite et Endeemisme a Madagascar*: 232.

Material examined: 1 ex., (ZSIA 10058), stream, Gundia, dist: Dakshin Kannada, 19. ix. 2004; 1 ex.,

(ZSIA 10118), plantation, Giriguddhai, Dist: Dakshin Kannada, 22.ix.2004; 1 ex., (ZSIA 10121), Gucha, Gundia, Dist, Dakshin Kannada, 23.ix.2004.

Diagnosis: Dorsum pale brown, dorsal skin smooth, upper surface of the snout and the anterior third of the eyelid having a distinct broad white band. A dark 'W' shaped band present between the eyes. A 'U' shaped mark present on the sides of the body and hip. Both the lines having prominent cross bars. Throat and abdomen white. Thighs yellowish, ventrally. A dark broad band extending from the eye to snout. Foot chocolate brown in colour. Head longer than broad, Snout obtusely pointed, projecting beyond the mouth. Nostril slightly nearer to the tip of the snout than eye. Tympanum absent. Forelimb and hindlimb short. Fingers long and pointed, first finger longer than second. Subarticular tubercles of fingers large and conical in shape. Tibiotarsal articulation reaching to the eye. Toes short, half webbed. Subarticular tubercles of toes small and inconspicuous. A large shovel shaped strongly compressed inner metatarsal tubercle present. Outer metatarsal tubercle is small and is present at the base of fourth toe.

Distribution : Mysore, Karnataka (type locality) (Dutta, 1997).

Elsewhere : Not known.

Note : Type of this species is found to be lost and it needs type designation from the type locality. Endemic to Karnataka parts of Western Ghats.

Family MICRIXALIDAE Dubois, Ohler and Biju

Genus ***Micrixalus*** Boulenger

28. ***Micrixalus elegans*** (Rao, 1937)*

Elegant Torrent Frog

1937. *Philautus elegans* Rao, *Proc. Indian Acad. Sci., Ser. B*, **6**: 407.

2001. *Micrixalus elegans* - Bossuyt and Dubois, *Zeylanica*, **6**: 48.

Diagnosis: Dorsum crimson, ventrum yellowish. Dorsal skin smooth, sometimes with minute tubercles. Ventrum smooth. Head moderately large, flat, longer than broad. Tympanum reddish, distinct and close to the eyes. Lateral region up to the posterior border of the eyes black. Upper jaw whitish, lower jaw with a number of black spots. A number of black bands present on the posterior region of the limbs. Throat and chest mottled with brown, thighs pinkish. Forelimbs moderately long, fingers free with prominent well-developed discs and grooves. Hindlimbs moderately long, tibiotarsal articulation reaching the eyes. Toes short, less than half webbed, tips of the toes dilated into well-developed discs. Sub-articular tubercles feebly developed. A small outer metatarsal tubercle present. Inner metatarsal tubercle absent.

Distribution : Known from type locality only.

Elsewhere : Not known.

Note : Type of this species is found to be lost and it needs type designation from the type locality. Endemic to Karnataka parts of Western Ghats.

29. ***Micrixalus fuscus*** (Boulenger, 1882)

Dusky Torrent Frog

1882. *Ixalus fuscus* Boulenger, *Cat. Batr. Sal. Coll. Brit. Mus., Ed.* **2**: 96.

1888. *Micrixalus fuscus* - Boulenger, *Proc. Zool. Soc. London, 1888*: 205.

1942. *Micrixalus herrei* Myers, *Proc. Biol. Soc. Washington*, **55**: 71.

1946. *Staurois fuscus* - Forcart, *Verh. Naturforsch. Ges. Basel*, **57**: 130.

Material examined: 3 exs., WGRC/V/A/595, Manikyadhara Betta, Kudremukh National Park, Chickmagalur, 19.x.2005; 1 ex., WGRC/V/A/598, Muduba, Chickmagalur, 21.x.2005; 1 ex., WGRC/V/A/602, Bhagavathi Forest, KNP, Chickmagalur, 24.x.2005.

Diagnosis: Snout pointed, prominent, generally longer than the orbital diameter; canthus rostralis angular; loreal region flat, vertical; nostril halfway between the eye and the tip of the snout; interorbital space as broad as the upper eye lid; tympanum small, indistinct. Toes nearly entirely webbed; disks moderate; subarticular tubercles small; a small inner metatarsal tubercle present. The tibiotarsal

articulation reaches between the eye and the tip of snout when the leg is held along the body. Skin smooth above and beneath; a narrow glandular lateral fold and a fold from the eye to the shoulder present. Brown or pinkish above; sides of head and body generally darker; limbs with dark cross bands; hinder side of thighs dark brown, with a more or les accentuated light median stripe; whitish beneath, marbled with brown. Male with two internal vocal sacs, the opening of which are very small.

Distribution : Karnataka, Kerala and Tamil Nadu (Dutta, 1997).

Elsewhere : Not known.

Note : Endemic to Western Ghats. Distribution in Karnataka doubtful.

30. ***Micrixalus kottigeharensis*** (Rao, 1937)*
Kottigehar Torrent Frog

1937. *Philautus kottigeharensis* Rao, *Proc. Indian Acad. Sci., Ser. B*, **6**: 408.

2001. *Micrixalus kottigeharensis* - Bossuyt and Dubois, *Zeylanica*, **6**: 49.

Diagnosis: Dorsum deep bronze, ventrum smooth. Sides of head body and limbs banded by deeper strips. Undersurface of the thighs red. Sides of the body yellowish to white. Dorsal surface minutely tuberculated. Prominent supra-temporal and dorso-lateral folds present. Head depressed, snout actually pointed at the tip and projecting beyond the mouth. Nostril equi distant from the eyes and tip of the snout. Tympanum fairly distinct and nearly half the diameter of the eyes. Fingers free. Tips of the finger and toes dilated in to large discs. First finger slightly larger than the second and third slightly longer than snout. Sub-articular tubercles of fingers and toes feebly developed. Tibiotarsal articulation reaching tip of snout. Toes fully webbed. Outer metatarsals united at the base or separate. A minute inner metatarsal tubercle present.

Distribution : Known from type locality only.

Elsewhere : Not known.

Note : Type of this species is found to be lost and it needs type designation from the type locality. Endemic to Karnataka parts of Western Ghats.

31. ***Micrixalus narainensis*** (Rao, 1937)*
Narain's Torrent Frog

1937. *Philautus narainensis* Rao, *Proc. Indian Acad. Sci., Ser. B*, **6**: 413.

2001. *Micrixalus narainensis* - Bossuyt and Dubois, *Zeylanica*, **6**: 50.

Diagnosis: Dorsum brownish, ventral side dirty white. Head moderately large and longer than broad. Snout pointed and projecting beyond the mouth. Nostril equidistant from the eyes and tip of snout. Tympanum distinct and nearly half of the diameter of the eyes. Forelimbs moderately long, brownish. A number of faint bands present on the anterior border of thighs as well as on the upper region of tibia. Skin smooth, Fingers rather short. Tips of the fingers dilated in to prominent discs. First finger shorter than second. Only one sub-articular tubercle present at the base of the first finger. Hindlimbs long, tibiotarsal articulation reaching beyond the tip of the snout. Toes rather small with minute discs and partly webbed. Outer metatarsal tubercle free at base.

Distribution : Known from type locality only.

Elsewhere : Not known.

Note : Type of this species is found to be lost and it needs type designation from the type locality. Endemic to Karnataka parts of Western Ghats.

32. ***Micrixalus phyllophilus*** (Jerdon, 1853)*
Pink-thighed Torrent Frog

1854. *Limnodytes? phyllophila* Jerdon, "1853", *J. Asiat. Soc. Bengal*, **22**: 532.

1869. *Ixalus opisthorhodus* Gunther, "1868", *Proc. Zool. Soc. London, 1868*: 484.

1888. *Micrixalus opithorhodus* - Boulenger, *Proc. Zool. Soc. London, 1888*: 205.

1987. *Micrixalus phyllophilus* - Dubois, "1986", *Alytes*, **5**: 50.

Diagnosis: Medium sized species (35 mm), Colour on upper side brown, while sides are lighter. The underside is yellow with a series of dark mottled

markings which are dense over the throat, rendering it dark coloured. The lower surface of the hind limbs are rose colour. The anal region black. A very prominent black band is present on either side of the head under each eye and nostril. The skin is smooth above, with a few short, oblique folds. A strong narrow glandular lateral fold and another cutaneous fold extending from the eye to shoulder. The ventral surface smooth. A few white tubercles sometimes present on the sides of the trunk and a few oblique folds and wrinkles on the head, back and hind limbs. Head small blunt. Tympanum small concealed. The interorbital width is wide and slightly broader than upper eyelid. The nostril is almost equidistant from the eye and tip of the snout. Tibiotarsal articulation reaching between eye and tip of the snout. A small inner metatarsal tubercle present.

Distribution : Karnataka, Kerala and Tamil Nadu (Dutta, 1997).

Elsewhere : Not known.

Note : Endemic to Western Ghats.

33. ***Micrixalus saxicola*** (Jerdon, 1853)
Small Torrent Frog

1854. *Polypedates saxicola* Jerdon, "1853", *J. Asiat. Soc. Bengal*, **22**: 533.

1882. *Ixalus saxicola* - Boulenger, *Cat. Batr. Sal. Coll. Brit. Mus., Ed.* **2**: 97.

1888. *Micrixalus saxicola* - Boulenger, *Proc. Zool. Soc. London, 1888*: 205.

Material examined: 3 exs., WGRC/V/A/597, Muduba, Chickmagalur, 21.x.2005; 2 exs., WGRC/V/A/601, Bhagavathi Forest, KNP, Chickmagalur, 24.x.2005; 3 exs., WGRC/V/A/707, Haligekerae, Chickmagalur, 15.xi.2007; 11 exs., WGRC/V/A/655, Chowdikattae, BWLS, Chickmagalur, 06.xi.2006; 2 exs., WGRC/V/A/658, Halasinakhan, Chickmagalur, 14.xi.2006;, 1 ex., WGRC/V/A/711, Mullayanagiri, BWLS, Chickmagalur, 15.08.2007; 1 ex., WGRC/V/A/740, Hipla camp, Chikkamagaluru, 12.xi.2006; 3 exs., WGRC/V/A/220, Nemanckolly, Coorg, 7.iii.1994; 2 exs., WGRC/V/A/221, Ottekolly, Coorg, 8.iii.1994; 12 exs., WGRC/V/A/584, Hanuman gundi, Chickmagalur, 20.x. 2005.

Diagnosis: Tongue with a free pointed papilla in the anterior part of the median line. Snout sub acuminate, as long as the diameter of the orbit; canthus rostralis angular; loreal region flat, vertical; nostrils midway between eye and the tip of the snout; interorbital space as broad as the upper eyelid; tympanum small, hidden. Toes very broadly webbed, the web reaching the disks, disks very large; subarticular tubercles small; inner metatarsal tubercle small. Tibiotarsal articulation reaches the tip of the snout or somewhat beyond when the leg is held along the body. Skin smooth above, with more or less distinct darker reticulations; limbs with dark cross bands; throat and breast often marbled with brown. Males with internal vocal sacs, the opening of which are very small.

Distribution : Karnataka and Kerala (Dutta, 1997).

Elsewhere : Not known.

Note : Endemic to Karnataka and Kerala parts of Western Ghats.

34. ***Micrixalus swamianus*** (Rao, 1937)*
Ramaswami's Torrent Frog

1937. *Philautus swamianus* Rao, *Proc. Indian Acad. Sci., Ser. B*, **6**: 409.

2001. *Micrixalus swamianus* - Bossuyt and Dubois, *Zeylanica*, **6**: 49.

Diagnostic Character: Dorsum deep bluish, ventral surface of the thighs pinkish. Skin smooth. A Dorso-lateral fold extends from behind the posterior corner of the eyes to groin. Head longer than broad, snout pointed projecting beyond the mouth. Nostril equidistance from the eyes and tip of the snout. First finger shorter than the second. Tips of the finger dilated in to small discs. Sub-articular tubercles absent in the third and fourth fingers. Tibiotarsal articulation reaching the anterior corner of the eyes. Toes fully webbed. Sub articular tubercles of toes indistinct. A small and conical inner metatarsal tubercle present. Outer metatarsal separated at the base.

Distribution : Known from type locality only.

Elsewhere : Not known.

Note : Type of this species is found to be lost and it needs type designation from the type locality. Endemic to Karnataka parts of Western Ghats.

Family MICROHYLIDAE Gunther

Sub-Family MICROHYLINAE Gunther

Genus ***Kaloula*** Gray

35. ***Kaloula taprobanica*** Parker, 1934*

Sri Lankan Kaloula

1934. *Kaloula pulchra taprobanica* Parker, *Monogr. Frogs Fam. Microhylidae*: 86.

1996. *Kaloula taprobanica* - Dutta and Manamendra-Arachchi, *Amph. Fauna Sri Lanka*: 30.

Material examined: 1 ex., (ZSIA 9081), Luckunda estate, Virajpet Dist.- Srimangala Nadu, Coorg, 30-vii-1998.

Diagnosis: Dorsum dark and brick red areas forming a more or less symmetrical pattern. The brick red areas are a narrow inter-orbital band and broader dorso-lateral bands. Ventral side light gray, spotted with brown. Dorsal skin smooth or with scattered tubercles. Ventral smooth, granules usually present round the vent. Head broader than long, tympanum hidden, snout short, rounded as long as or a little longer than the diameter of the eye; nostril nearer to the tip of the snout than to eye. Interorbital width broader than that of upper eyelid. Fingers free with well developed truncate discs, toes one third webbed. Subarticular tubercles moderate. Two compressed metatarsal tubercles, the inner of which is about one and half times as long as outer. Tibiotarsal articulation reaches the axilla.

Distribution : West Bengal, Meghalaya, Assam, Bihar, Madhya Pradesh, Orissa, Karnataka and Tamil Nadu (Dutta, 1997).

Elsewhere : Nepal and Sri Lanka (Frost, 2010).

Genus ***Microhyla*** Tschudi

36. ***Microhyla ornata*** (Dumeril and Bibron, 1841)

Ornate Narrow-mouthed Frog

1841. *Engystoma ornatum* Dumeril and Bibron, *Erp. Gen.*, **8**: 745.

1843. *Siphneus ornatum* - Fitzinger, *Syst. Rept.*: 33.

1854. *Engystoma malabaricum* Jerdon, "1853", *J. Asiat. Soc. Bengal*, **22**: 534.

1854. *Engystoma carnaticum* Jerdon, "1853", *J. Asiat. Soc. Bengal*, **22**: 534.

1859. *Diplopelma ornatum* - Gunther, "1858", *Cat. Batr. Sal. Coll. Brit. Mus.*: 50.

1870. *Diplopelma carnaticum* - Stoliczka, *J. Asiat. Soc. Bengal*, **39**: 154.

1882. *Microhyla (Engystoma) carnatica* - Mason, *Burma, Ed.* **3**: 292.

1882. *Microhyla ornata* - Boulenger, *Cat. Batr. Sal. Coll. Brit. Mus., Ed.* **2**: 165.

1927. *Microhyla (Diplopelma) ornata* - Bourret, *Fauna Indochine, Vert.*, **3**: 263.

Material examined: 35 exs., (ZSIA 9080), Luckunda estate, Virajpet Dist.-, Srimangala Nadu, Coorg, 16-viii-1998; 1 ex., (ZSIA 10946), Honavar, Dist.- Uttar Kannada; 5 exs., (ZSIA 10828), Hatraegate pump house, 8 km. from forest rest House, Medikeri, Dist.- Kodagu, 11.xi.2003; 3 exs., (ZSIA 10829), Cherambane 30 Km. away from FRH, Talekaveri, Dist.- Kodagu, 15.xi.2003; 2 exs., (ZSIA 10837) 5 Km. from Talekaveri, Dist.- Kodagu, Karnataka, 15.xi.2003; 3 exs., (ZSIA 10885), 6 Km. north east of FRH, Talekaveri, Dist.- Kodagu, Karnataka, 16.xi.2003; 8 exs., (ZSIA 10879 & 10944), Bemanholai hill, 6 Km. from Subramanya, Dist.- Dakshin Kannada, 24.xi.2003; 3 exs., WGRC/V/A/652, Rashigudda, BWLS, Chickmagalur, 16.xi.2006; 1 ex., WGRC/V/A/673, Muthodi, Chickmagalur, 20.xi.2007; 2 exs., WGRC/V/A/735, Kadubailu, BWLS, Chikkamagaluru, 13.xi.2006.

Diagnosis: A small slender microhylid. The colour pattern of the back is distinctive. Interorbital width nearly twice as broad as upper eyelid. Toes with a rudiment of web. Two prominent metatarsal tubercles. Tibiotarsal articulation reaches the shoulder or slightly beyond the anterior border of eye when the leg is held along the body. The heels meet when the legs are folded at right angles to the body. Skin smooth or slightly tubercular. The characteristic pattern on the back, which may be

bright pink or brown of varying shades, begins between the eyes where it extends to both eyelids, narrows on the nape, widens above the shoulder, narrows again and finally broadens out sending a stripe to the groin and the thigh. A dark streak from behind the eye to the shoulder, limbs cross barred. White below, throat and chest may be stippled with brown. In males, throat black during breeding season.

Distribution : Throughout India (Dutta, 1997), including Andaman and Nicobar Islands (Sarkar, 1990).

Elsewhere : Japan, China, Pakistan, Nepal and Sri Lanka Malaysia (Frost, 2010).

37. ***Microhyla rubra*** (Jerdon, 1854)

Red Narrow-mouthed Frog

1854. *Engystoma rubrum* Jerdon, "1853", *J. Asiat. Soc. Bengal*, **22**: 534.

1864. *Copea fulva* Steindachner, *Verh. Zool. Bot. Ges. Wien*, **14**: 286.

1882. *Microhyla rubra* - Boulenger, *Cat. Batr. Sal. Coll. Brit. Mus., Ed.* **2**: 164.

1987. *Microhyla (Diplopelma) rubra* - Dubois, *Alytes*, **6**: 4.

Material examined: 3 exs., (ZSIA 10810), in and around F.R.H Murkal, Dist.- Kodagu, 08-xi-2003; 1 ex., (ZSIA 10889), Kempana valley, 35 Km. from F.R.H Murkal, Dist.- Kodagu, 9.xi.2003.

Diagnosis: Dorsum brownish; venter dull whitish, darker on gular region; dorsum warty, ventrally smooth. Head broader than long; snout rounded a little longer than diameter of eye; nostril nearer to tip of snout than eye. Inter-orbital width broader than that of upper eyelid; tympanum hidden. Fingers tree, first finger much shorter than second, tips swollen; two large shovel shaped metatarsal tubercle present. Tibiotarsal articulation reaching eyes.

Distribution : Goa, Karnataka, Tamil Nadu and West Bengal (Dutta, 1997).

Elsewhere : Sri Lanka (Frost, 2010).

Note : Endemic to Western Ghats and Sri Lanka.

38. ***Microhyla sholigari*** Dutta and Ray, 2000*

Sholigari microhylid

2000. *Microhyla sholigari* Dutta and Ray, *Hamadryad*, **25**: 39.

Diagnosis: Head wider than long, finger and toe tips dilated, a median longitudinal groove dorsally on the toe, outer and inner side of the 4th toe webbed between proximal and distal sub-articules; two large metatarsal tubercles, inner elongated, outer rounded; venter white. Nostrils dorso-lateral with rounded openings; loreal region oblique, eye large, pupil circular; tympanum not visible due to supra tympanic fold. Finger discs absent, a light brown mid dorsal marking starting between eyes widens at mid body, narrow on abdomen.

Distribution : Karnataka and Kerala (Chanda, 2002).

Elsewhere : Not known.

Note : Endemic to Karnataka and Kerala parts of Western Ghats.

Genus ***Ramanella*** Rao and Ramanna

39. ***Ramanella minor*** Rao, 1937*

Small Ramanella

1937. *Ramanella minor* Rao, *Proc. Indian Acad. Sci., Ser. B*, **6**: 417.

Diagnosis: Dorsum olive with a dark median band extending posterior to the inter orbital space. A dark spot present in between the eyes. Skin smooth, dorsum with dark olive band. Olive bands also present on the flank. Snout short and broadly truncated. Interorbital distance broad. Fingers moderately long. Tips of fingers dilated in to triangular expansions. Hindlimbs small. Tibiotarsal articulation reaches middle region of the body. Toes free with pointed tips. Subarticular tubercles well developed. A conical and moderately developed inner metatarsal tubercle and a round in conspicuous outer metatarsal tubercle present.

Distribution : Known from type locality (Sakaleshpur, Hassan, Karnataka) only.

Elsewhere : Not known.

Note : Type of this species is found to be lost and it needs type designation from the type locality. Endemic to Karnataka parts of Western Ghats.

40. ***Ramanella montana*** (Jerdon, 1854)
Jerdon's Ramanella

1854. *Hylaedactylus montanus* Jerdon, "1853", *J. Asiat. Soc. Bengal*, **22**: 533.

1934. *Ramanella montana* - Parker, *Monogr. Frogs Fam. Microhylidae*: 91.

Material examined: 1 ex., WGRC/V/A/653, Rashigudda, BWLS, Chickmagalur, 16.xi.2006.

Diagnosis: A small sized frog, post narial ridges well marked and nearly in contact on mid-line; finger discs twice as broad as penultimate joint. Toes webbed, webbing more extensive in the male than the female, two metatarsal tubercles; tibiotarsal articulation reaches to shoulder or between shoulder and eye. Skin smooth, coloration on the dorsum brown with varying shades. Below dark brown, almost blackish with white spots or blotches.

Distribution : Gujarat, Maharashtra, Karnataka, Kerala and Tamil Nadu (Dutta, 1997).

Elsewhere : Not known.

Note : Endemic to Western Ghats.

41. ***Ramanella mormorata*** Rao, 1937*
Marbled Ramanella

1937. *Ramanella mormorata* Rao, *Proc. Indian Acad. Sci., Ser. B*, **6**: 419.

Diagnosis: Dorsum pale olive with darker bands between eyes and with scattered darker blotches on skin; venter pale yellowish, variegated with dark brown; more or less smooth; head broader than long; snout truncated, as long as diameter of eye, nostril nearer to tip of snout than eye. Interorbital with over two times greater than that of upper eyelid; tympanum hidden. Fingers free, first shorter than second, tips bearing well developed truncated disc; sub-articular tubercles of fingers and toes indistinct, toes basally webbed three phalanges of fourth toe free; tips obtusely swollen; a large elongated shovel shaped inner metatarsal tubercle and distinct round outer metatarsal tubercle present. Tibiotarsal articulation reaching near axilla; heels do not overlap when hind limbs are set at right angles to body.

Distribution : Goa and Karnataka (Dutta, 1997).

Elsewhere : Not known.

Note : Type of this species is found to be lost and it needs type designation. Endemic to Karnataka parts of Western Ghats. Endemic to Western Ghats.

42. ***Ramanella triangularis*** (Gunther, 1876)*
Malabar Ramanella

1876. *Callula triangularis* Gunther, "1875", *Proc. Zool. Soc. London, 1875*: 576.

1918. *Kaloula triangularis* - Rao, *Rec. Indian Mus.*, **15**: 44.

1934. *Ramanella triangularis* - Parker, *Monogr. Frogs Fam. Microhylidae*: 94.

1937. *Ramanella triangularis rufeventris* Rao, *Proc. Indian Acad. Sci., Ser. B*, **6**: 418.

Diagnosis: Dorsum olive brown with prominent triangular spots or markings covering nearly the entire length of the back. This species can be distinguished from congeners in having a large, triangular blackish spot on the back. Lateral sides blackish brown. A numbers of white dots present on the entire ventral surface of body. Limbs blackish brown with pale olive brown patches. Skin smooth, some times with small tubercles scattered on the back. Snout blunt and rounded in shape. Fingers moderately long and the tips dilated in to small discs. Toes free with no trace of web. Tips of the toes almost pointed. Tibiotarsal articulation reaching shoulder or slightly beyond it.

Distribution : Karnataka, Kerala and Tamil Nadu (Dutta, 1997).

Elsewhere : Not known.

Note : Endemic to Western Ghats.

43. ***Ramanella variegata*** (Stoliczka, 1872)*
Variegated Ramanella

1854. *Hylaedactylus carnaticus* Jerdon, "1853", *J. Asiat. Soc. Bengal*, **22**: 533.

1872. *Callula variegata* Stoliczka, *Proc. Asiat. Soc. Bengal, 1872*: 111.

1876. *Callula olivacea* Günther, "1875", *Proc. Zool. Soc. London, 1875*: 576.

1918. *Kaloula variegata* - Rao, *Rec. Indian Mus.*, **15**: 43.

1925. *Ramanella symbioitica* Rao and Ramanna, *Proc. Zool. Soc. London, 1925*: 1445.

Diagnosis: Dorsum more or less smooth and brownish. Venter smooth and white with reddish brown at gular region; anal region poorly granular. Head broader than long; snout rounded, as long as diameter of eye, nostril nearer to tip of snout than eye; inter-orbital with much broader than the upper eyelid; tympanum hidden; dermal ridge a little away behind the internal nares. Fingers free, first shorter than second, tips bearing well developed truncated disc; sub-articular tubercles of fingers and toes distinct. Toes feebly webbed, tips a little dilated; inner metatarsal tubercles prominent, outer metatarsal tubercle not prominent. Tibiotarsal articulation reaching the shoulder.

Distribution : Madhya Pradesh, West Bengal, Orissa, Tamil Nadu, Karnataka and Kerala (Dutta, 1997).

Elsewhere : Sri Lanka (Frost, 2010).

Note : Restricted to India and Sri Lanka.

Genus ***Uperodon*** Dumeril and Bibron

44. ***Uperodon globulosus*** (Gunther, 1864)*
Indian Balloon Frog

1864. *Cacopus globulosus* Gunther, *Rept. Brit. India*: 416.

1867. *Systoma globulosum* - Cope, *J. Acad. Nat. Sci. Philadelphia, Ser. 2*, **6**: 194.

1931. *Uperodon globulosum* - Parker, *Arch. Zool. Ital. Torino*, **16**: 1243.

1985. *Uperodon globulosus* - Frost, *Amph. Species World*: 391.

Diagnosis: Dorsum reddish brown; venter dull white; dorsum smooth or slightly tuberculated, ventrally wrinkled. Head broader than long, snout rounded, about twice as long as diameter of eye, nostril equidistant from tip of snout and eye, inter orbital width about thrice width of upper eye lid, tympanum hidden. Fingers free, first shorter than second; tips not bearing disc; sub-articular tubercles of finger and toes not distinct; toes with a rudiment of web, both inner and outer shovel shaped metatarsal tubercles present in a large. Tibio-tarsal articulation not reaching shoulder.

Distribution : West Bengal, Orissa, Assam, Bihar, Madhya Pradesh, Gujarat, Maharashtra, Karnataka and Kerala (Dutta, 1997).

Elsewhere : Nepal (Frost, 2010).

45. ***Uperodon systoma*** (Schneider, 1799)
Marbled Balloon Frog

1799. *Rana systoma* Schneider, *Hist. Amph. Nat.*: 144.

1820. *Bombinator systoma* - Merrem, *Tent. Syst. Amph.*: 178.

1829. *Engystoma marmoratum* Cuvier, *Regne Animal., Ed. 2*, **2**: 112.

1829. *Bufo (Engystoma) marmoratus* Cuvier, *Regne Animal., Ed. 2*, **2**: 111.

1829. *Bufo (Breviceps) marmoratus* Cuvier, *Regne Animal., Ed. 2*, **2**: 112.

1838. *Systoma leschenaultii* Tschudi, *Classif. Batr.*: 49, 86.

1838. *Engystoma marmoratum* - Gurrin-Meneville, *Icon. Regne Animal*, **3**: 17, pl. 27, fig. 3.

1838. *Rana (Breviceps) marmoratum* - Guerin-Meneville, *Icon. Regne Animal*, **3**: 17.

1841. *Uperodon marmoratum* - Dumeril and Bibron, *Erp. Gen.*, **8**: 749.

1854. *Hyperodon marmoratum* - Jerdon, "1853", *J. Asiat. Soc. Bengal*, **22**: 533.

1864. *Cacopus systoma* - Gunther, *Rept. Brit. India*: 415.

1867. *Systoma marmoratum* - Steindachner, *Reise Osterreichischen Fregatte Novara, Zool.*: 36.

1868. *Pachybatrachus Petersii* Keferstein, *Arch. Naturgesch.*, **34**: 274.

1931. *Uperodon systoma* - Parker, *Arch. Zool. Ital. Torino*, **16**: 1243.

2002. *Uperodon systomus* Anders, *In Schleich and Kästle (eds.), Amph. Rept. Nepal*: 199.

Material examined: 1 ex., (ZSI A10832), Bababudin Hills, Babase Kathi area, Dist.-Chikmagalur, 11.xi.1962.

Diagnosis: Dorsum olive, marbled; venter white; dorsum smooth or slightly tuberculated and spotted,

darker. Venter smooth and spotless. Head broader than long; snout rounded, as long as the diameter of the eye; nostril equidistant from the tip of the snout and the eye; inter-orbital width about twice the width of the upper eyelid; tympanum hidden. Fingers free, first shorter than second, tips not bearing discs; sub-articular tubercles of fingers and toes not very distinct; two shovel-shaped metatarsal tubercles present, the inner very large. Tibiotarsal articulation not reaching the shoulder.

Distribution : Himachal Pradesh, Uttar Pradesh, West Bengal, Orissa, Andhra Pradesh, Tamil Nadu, Kerala, and Karnataka (Dutta, 1997).

Elsewhere : Sri Lanka, Pakistan and Nepal (Frost, 2010).

Family NYCTIBATRACHIDAE
Blommers-Schlosser

Genus ***Nyctibatrachus*** Boulenger

46. ***Nyctibatrachus aliciae*** Inger, Shaffer, Koshy and Bakde, 1984*

Alicia's Night Frog

1984. *Nyctibatrachus aliciae* Inger, Shaffer, Koshy, and Bakde, *J. Bombay Nat. Hist. Soc.*, **81**: 414.

Diagnosis: A small sized frog, dorsal surface of the body generally dark brown with light cream colored blotches. A mid-dorsal diffused band present and is interrupted with dark brown. A light cream spot present between the eyes. A number of light brown and cream bars present on both the limbs. Throat white with dark brown mottling. Body covered with loose skin and with irregular series of short ridges covering the entire back including the limbs. A strong well developed ridge extending from the lip and running over the tip of the snout between the nostrils present. A number of strong tubercles present on the upper eyelid; with numerous tiny, white- tipped tubercles on the upper surface of the calves, tarsus as well as above the vent. Snout rounded in shape. Nostrils closer to the tip of the snout than to eyes. Upper eyelids very small, covering less than one-fourth of the eye ball. A well developed supratympanic fold extending from the posterior region of the eye up to the shoulder present. Tympanum completely hidden. Forelimbs stout. Fingers long, slender and free. Tips of fingers dilated in to small rounded disks with a prominent circum marginal groove, separating the dorsal and ventral portions of the disks. Hind limbs robust and short. Toes three-fourth webbed. Tips of toes dilated into prominent disks which are much larger than finger disks. Subarticular tubercles well developed and oval in shape. A long, slender inner and a nearly rounded outer metatarsal tubercle present.

Distribution : Kerala, Karnataka (Dutta, 1997).

Elsewhere : Not known.

Note : This species requires neotype designation and its distribution in Karnataka doubtful. Endemic to Western Ghats.

47. ***Nyctibatrachus dattatreyaensis*** Dinesh, Radhakrishnan and Bhatta, 2008

Dattatreya Night Frog

2008. *Nyctibatrachus dattatreyaensis* Dinesh, Radhakrishnan and Bhatta, *Zootaxa*, **1914**; 45-56.

Material examined: 1 ex., WGRC/V/A/646, Datta Peeta, Chickmagalur, 27.xii.2007; 1 ex., WGRC/V/A/647, Datta Peeta, Chickmagalur, 09.xii.2006; 1 ex., WGRC/V/A/648, Datta Peeta, Chickmagalur, 09.xii.2006; 1 ex., WGRC/V/A/649, Datta Peeta, Chickmagalur, 09.xii.2006; 1 ex., WGRC/V/A/650, Datta Peeta, Chickmagalur, 27.xii.2007; 1 ex., WGRC/V/A/651, Datta Peeta, Chickmagalur, 27.xii.2007; 2 exs., WGRC/V/A/702, Datta Peeta, Chickmagalur, 22.vi.2009; 7 exs., WGRC/V/A/705, Datta Peeta, Chickmagalur, 9.xi.2006.

Diagnosis: A medium sized night frog, head wider than long, snout slightly projecting beyond mouth; whole of dorsum corrugated with several transverse folds, the anterior three folds very prominent and with a longitudinal dorsolateral fold on either side; lateral part of the body with two longitudinal folds; a well defined supratympanic fold from posterior corner of eye to shoulder; a small fold from eye to the posterior corner of mouth commissure; fingers and toes with disks, circummarginal grooves restricted to toe discs;

webbing on toes medium (3/4th); femoral glands and thumb pad very prominent in adult males; body, colored reddish-brown to blackish brown dorsally with two yellowish dorsolateral bands and pale ventrally.

Distribution : Inside and surroundings of Bhadra Wildlife Sanctuary, Chikmagalur, Karnataka, India.

Elsewhere : Not known.

Note : Endemic to Karnataka parts of Western Ghats.

48. ***Nyctibatrachus humayuni*** Bhaduri and Kripalani, 1955*
Bombay Night Frog

1955. *Nyctibatrachus humayuni* Bhaduri and Kripalani, *J. Bombay Nat. Hist. Soc.*, **52**: 852.

Diagnosis: Dorsum grayish to brownish, black with irregular darker markings; Venter pale yellow. Indistinct cross bar present in the limbs; Dorsally covered with numerous fold; Head broader than long, tympanum hidden, Fingers free, dorso-ventrally flattened; Tips of fingers dilated into prominent discs with horizontal circummarginal groove; hindlimb stout; tibiotarsal articulation reaching in front of eye; toes three fourth webbed. Inner metatarsal tubercle present; outer metatarsal tubercle absent.

Distribution : Maharashtra and Karnataka (Dutta, 1997).

Elsewhere : Not known.

Note : Endemic to Western Ghats and its distribution in Karnataka doubtful.

49. ***Nyctibatrachus karnatakaensis*** Dinesh, Radhakrishnan, Reddy and Gururaja, 2007
Giant wrinkled frog

2001. *Nyctibatrachus hussaini* Krishnamurty, Reddy, and Gururaja, *Curr. Sci.*, **80**: 887.

2007. *Nyctibatrachus karnatakaensis* Dinesh, Radhakrishnan, Reddy and Gururaja, *Curr. Sci.*, **93** (2): 246-250.

Material examined: 1 ex., WGRC/V/A/579, Manikyadhara Betta, Kudremukh National Park, Chickmagalur, 19.x.2005.

Diagnosis: A very large and colored species of *Nyctibatrachus*; body squat and not constricted at waist; head wider than long, snout blunt, canthus rostralis and tympanum indistinct, a distinct supra tympanic fold, a small fold from base of posterior end of eye lid to angle of jaw, a distinct Y shaped fold commencing from anterior corner of the eyes to the tip of snout and a small transverse fold between the inter-orbital space present. Webbing on toes reaching base of disks except on toe IV, where it reaches distal subarticular tubercle; tips of both fingers and toes flattened to form disks with distinct grooves separating dorsum of disks from venter; prominent subarticular tubercles on fingers and toes; toe tips rounded with circummarginal grooves. Subarticular tubercles well developed, oval, numbering one on first and second toes; two on third and fifth toes; and three on fourth toe. Inner metatarsal tubercle thick and elongated; outer metatarsal tubercle absent; toe disks wider than finger disks; a slightly crescentic tarsal fold extending from posterior edge of inner metatarsal tubercle up to just beginning of tarsus present. Dorsum blackish brown mottled with yellow spots, the mottling extending to tip of toes and fingers including upper eye lids; a dotted small white band from posterior end of eye to angle of joining of forearm present; small white band present on both fingers and toes; no dorsolateral fold present; throat granular with fine longitudinal folds; rest of venter glandular, colored light creamish brown and with fine folds; fore and hind limbs brownish with granular folds; hind limbs barred with unclear dotted white bands; tongue unpigmented creamish.

Distribution : In and around Kudremukh National Park, Karnataka.

Elsewhere : Not known.

Note : Endemic to Karnataka parts of Western Ghats.

50. ***Nyctibatrachus kempholeyensis*** (Rao, 1937)*
Kempholey Night Frog

1937. *Nannobatrachus kempholeyensis* Rao, *Proc. Indian Acad. Sci., Ser. B*, **6**: 401.

1987. *Nyctibatrachus kempholeyensis* - Dubois, "1986", *Alytes*, **5**: 68.

Diagnosis: Skin smooth or slightly granulate behind the eyes and shoulder; no tarsal fold on the back; a short temporal fold only occasionally present on one side and extending beyond the shoulder. Abdomen and lower surface of the thighs finely granulate. Pupil red; body stout and toad like appearance. Head flat, broader than long, tympanum hidden; upper eyelid equal to the distance between the nostrils or the diameter of the eye; fingers rather small, first slightly smaller than the second; sub-articular tubercles distinct on the third and fourth fingers only. Hind limbs short; limbs without cross bar; tibiotarsal articulation reaching the posterior border of eye; the heels do not meet when the limbs are folded; Tips of toes and fingers dilated in to small discs sub-articular tubercles of the toes indistinct, inner metatarsal tubercle very minute and outer at the base of fourth toe more minute; No rudiment of web & lateral fold.

Distribution : Known from type locality (Hills of Kempholey Ghats, Hassan) only.

Elsewhere : Not known.

Note : Type of this species is found to be lost and it needs type designation from the type locality. Endemic to Karnataka parts of Western Ghats.

51. ***Nyctibatrachus major*** Boulenger, 1882
Malabar Night Frog

1882. *Nyctibatrachus major* Boulenger, *Cat. Batr. Sal. Coll. Brit. Mus., Ed.* **2**: 114.

1910. *Rana travancorica* Annandale, *Rec. Indian Mus.*, **5**: 191.

Material examined: 6 exs., WGRC/V/A/198, Nemanckolly, Coorg, 7.iii.1994; 1 ex., WGRC/V/A/592, Manikyadhara Betta, Kudremukh National Park, Chickmagalur, 19.x.2005.

Diagnosis: Habitus stout. Vomerine teeth in two straight series, oblique in the young, much behind the level of the choanae; snout very short, without canthus rostralis; eyes very prominent, obliquely directed forwards and upwards; upper eyelid very narrow; interorbital space twice as broad as the upper eyelid. Fingers moderate, first much shorter than second; toes moderate, ¾ webbed; tips of fingers and toes with disks, only toes with circum marginal grooves; subarticular tubercles not much developed and rather indistinct; inner metatarsal tubercle small, elongate and scarcely prominent. The tibiotarsal articulation reaching the eye, or somewhat beyond when the leg is held along the body. Dorsum with very thin, closely set vermiculated folds; upper eyelids covered with strong tubercles and with a rather indistinct oblique fold beneath the eye; throat with slight longitudinal folds. Brown above, with rather indistinct darker and lighter markings; brownish beneath, more or less speckled with brown. Male with two internal vocal sacs.

Distribution : Karnataka, Kerala and Tamil Nadu (Dutta, 1997).

Elsewhere : Not known.

Note : Endemic to Western Ghats.

52. ***Nyctibatrachus petraeus*** Das and Kunte, 2005
Castle rock Night frog

2005. *Nyctibatrachus petraeus* Das and Kunte, *J. Herpetol.*, **39**: 465.

Material examined: 1 ex., WGRC/V/A/610, Kathlae Khan, Uttara Kannada, 9.vi.2006; 1 ex., WGRC/V/A/701, Chorla, Belgaum, 06.viii.2009.

Diagnosis: Vomerine teeth in two oblique groups just behind the level of the choanae. A free, pointed papilla on the middle of the tongue. Head moderate; snout obtuse, with obtuse canthus rostralis and concave loreal region; nostril nearer to the end of the snout than to the eye; interorbital space a little narrower than the upper eyelid, tympanum distinct, two thirds the diameter of the eye. Fingers moderate, first not extending quite as for as second; toes two-thirds webbed, the web reaching the disks of the third and fifth toes; tips of fingers and toes dilated into small but well-developed disks; subarticular tubercles moderate; a single, small, oval inner metatarsal tubercle; no tarsal fold. The tibiotarsal articulation reaches halfway between the eye and

the end of the snout. Skin of back with small scattered longitudinal warts; a strong fold from the eye to the shoulder. Brown above, with small dark spots; limbs with dark transverse bands; lower parts white, throat mottled with brown. From snout to vent 1.25 inches.

Distribution : Karwar, Karnataka (type locality).

Elsewhere : Not known.

Note : Endemic to Western Ghats, this species requires lectotype designation.

53. ***Nyctibatrachus sanctipalustris*** Rao, 1920*
Coorg Night Frog

1920. *Nyctibatrachus sancti-palustris* Rao, *J. Nat. Hist. Soc. Bombay*, **27**: 125.

1920. *Nyctibatrachus sanctipalustris var. modestus* Rao, *J. Nat. Hist. Soc. Bombay*, **27**: 125.

1987. *Nyctibatrachus modestus* - Dubois, "1986", *Alytes*, **5**: 68.

Diagnosis: Skin nearly smooth in young by covered by short semicircular folds on the back and the sides in the adult. A median fold on the snout, forking behind the adult, but generally continued between the eyes in the young. A broad dark band between the eyes. Abdomen yellow in the young, the liver showing through the transparent skin in the form of a squarish dark patch. In the young the upper surface of the limbs is lighter, the dark bands extending on the toes. A triangular bright yellow mark on the snout and orange yellow streaks on the shoulder, some time continued to the groin in the young. Length of snout nearly equals to the diameter of eye in the adult, but longer in young. Eyes moderately prominent directed upwards and forwards. Vomerine teeth in two strongly set. No canthus rostralis, which in the young is obtuse. The inter orbital space is slightly wider than the upper eyelid. Nostril equidistance between the eye and tip of snout. Fingers moderate, first shorter than the second, tips swollen, truncate. Toes more than half webbed, tips dilated in to disks. Sub-articular tubercle moderate. An inner metatarsal tubercle. Tarso-metatarsal articulation reaches the eye or slightly beyond.

Distribution : Known from type locality (the sacred swamps of the Cauvery (river), Brahmagiri Hills, Coorg, Karnataka) only.

Elsewhere : Not known.

Note : Endemic to Western Ghats.

54. ***Nyctibatrachus sylvaticus*** Rao, 1937*
Forest Night Frog

1937. *Nyctibatrachus sylvaticus* Rao, *Proc. Indian Acad. Sci., Ser. B*, **6**: 399.

Diagnosis: Dorsal surface brown and the ventral parts including the limbs whitish in colour. A number of faint cross bars present on the limbs. Skin with glandular folds and tubercles of various sizes. Ventral surface smooth. Tympanum partly or completely hidden. Supra-tympanic fold well developed. Tibia, tarsus and the fifth toe covered with prominent granules. Arms feebly granular. Forelimbs moderate. First finger shorter than second. Tips of fingers dilated in to small discs. Sub-articular tubercle moderately prominent. Hind limbs long. Tibiotarsal articulation reaching the posterior corner of the eye. Toes more than half webbed and the tips dilated in to small discs. Sub-articular tubercles moderately developed. An elongate and spade like inner metatarsal tubercle present.

Distribution : Known from type locality (Forests of Kempholey, Sakaleshpur, Hassan, Karnataka) only.

Elsewhere : Not known.

Note : Type of this species is found to be lost and it needs type designation from the type locality. Endemic to Karnataka parts of Western Ghats.

Family RANIDAE Rafinesque

Genus ***Clinotarsus*** Mivart

55. ***Clinotarsus curtipes*** (Jerdon, 1853)
Bicoloured Frog

1854. *Rana curtipes* Jerdon, "1853", *J. Asiat. Soc. Bengal*, 22: 532.

1868. *Pachybatrachus robustus* Mivart, *Proc. Zool. Soc. London, 1868*: 557.

1869. *Clinotarsus robustus* - Mivart, *Proc. Zool. Soc. London, 1869*: 280.

1870. *Hylorana curtipes* - Jerdon, *Proc. Asiat. Soc. Bengal, 1870*: 83.

1882. *Rana curtipes* - Boulenger, *Cat. Batr. Sal. Coll. Brit. Mus., Ed.* **2**: 61.

1920. *Rana (Hylorana) curtipes* - Boulenger, *Rec. Indian Mus.*, **20**: 131-133.

1987. *Rana (Hylarana) curtipes* - Dubois, "1986", *Alytes*, 5: 42.

1992. *Rana (Clinotarsus) curtipes* - Dubois, *Bull. Mens. Soc. Linn. Lyon*, **61**: 328.

2005. *Clinotarsus curtipes* - Krishna and Krishna, *Herpetol. Rev.*, **36**: 21.

Material examined: 2 exs., (ZSIA 9075), Luckunda Estate, Virajpet Dist., Srimangalanadu, Coorg, 23- viii-1998; 1 ex., (ZSIA 10019), stream, Kemphole, Dist.- Hassan, 16-xi-2004; 1 ex., (ZSIA 10208), Ballae halli Reserve Forest, Agumbae, Dist.- Shimoga, 01-x-2004; 2 exs., (ZSIA 10217 & ZSIA 10226), Forest near Bypass, Agumbae, 02-x-2004; 1 ex., WGRC/V/A/677, Halagekerae, BWLS, Chickmagalur,15.xi.2007; 1 ex., WGRC/V/A/587, Seethaboomi, Chickmagalur, 25.x. 2005; 1 ex., WGRC/V/A/657, Sukhalhatti, BWLS, Chickmagalur, 04.xi.2006; 1 ex., WGRC/V/A/660, Chowdikattae, BWLS, Chickmagalur, 06.xi.2006.

Diagnosis: Medium sized frogs; head depressed, snout obtusely pointed, canthus rostralis distinct. Loreal region concave. Interorbital width broader than upper eyelid. Tips of fingers and toes swollen or dilated into disks with indistinct circummarginal groove. First finger longer than second. Tibiotarsal articulation reaches the tympanum or eye. Heels meet when the limbs are folded at right angles to the body; toes ¾ or entirely webbed; inner metatarsal tubercle small; no tarsal fold. Males with internal vocal sacs. Forelimbs robust. Inner metacarpal tubercle on the inner side of the first finger with a small, grey, velvety, rugous patch. Skin smooth. Dorsolateral glandular fold narrow and moderately prominent. Supratympanic fold present. Coloration distinctive with grey above and with or without black dots; black below. Both colors are sharply separated.

Distribution : Karnataka and Kerala (Dutta, 1997 and Biju, 2001).

Elsewhere : Not known.

Note : Endemic to Kerala and Karnataka parts of Western Ghats.

Genus ***Hylarana*** Tschudi

56. ***Hylarana aurantiaca*** (Boulenger, 1904)
Golden Frog

1904. *Rana aurantiaca* Boulenger, *J. Bombay Nat. Hist. Soc.*, **15**: 430.

1920. *Rana (Hylorana) aurantiaca* - Boulenger, *Rec. Indian Mus.*, **20**: 127-130.

1922. *Rana (Hylorana) bhagmandlensis* Rao, *J. Nat. Hist. Soc. Bombay*, **28**: 441.

1987. *Rana (Hylarana) aurantiaca* - Dubois, "1986", *Alytes*, **5**: 42.

1987. *Rana (Hylarana) bhagmandlensis* - Dubois, "1986", *Alytes*, **5**: 42.

1992. *Rana (Sylvirana) aurantiaca* - Dubois, *Bull. Mens. Soc. Linn. Lyon*, **61**: 326.

1992. *Rana (Sylvirana) bhagmandlensis* - Dubois, *Bull. Mens. Soc. Linn. Lyon*, **61**: 326.

2005. *Hylarana aurantiaca* - Chen, Murphy, Lathrop, Ngo, Orlov, Ho, and Somorjai, *Herpetol. J.*, **15**: 237.

2006. *Sylvirana aurantiaca* - Frost, Grant, Faivovich, Bain, Haas, Haddad, de Sa, Channing, Wilkinson, Donnellan, Raxworthy, Campbell, Blotto, Moler, Drewes, Nussbaum, Lynch, Green, and Wheeler, *Bull. Am. Mus. Nat. Hist.*, **297**: 370.

Material examined: 2 exs., (ZSIA 10010 & 10015), Hemavathi river, Shakelshpur, Dist.- Hassan, 15.ix.2004; 1 ex., (ZSIA 10120), Plantation, Giriguddhai, Dist.-Hassan; 1 ex., WGRC/V/A/708, Virupakshikhan, Chickmagalur, 22.xi.2007; 1 ex., WGRC/V/A/588, Gangamoola, Chickmagalur, 27.x.2005; 5 exs., WGRC/V/A/604, Hanuman gundi, Chickmagalur, 20.x.2005.

Diagnosis: Small to medium sized slender frogs; snout long and narrow, canthus rostralis distinct; loreal region vertical. Interorbital width very slightly broader then the upper eyelid. Tympanum distinct; ½ or ? the diameter of the eye. Tips of fingers and toes dilated into disks with circummarginal groove. Toes ? webbed; subarticular tubercles moderate; the outer metatarsal tubercle small and round whereas the inner elongated. Tibiotarsal articulation

reaches between eye and the nostril when leg is held along the body. Males have a darkly pigmented humeral gland close to the axilla and an internal vocal sac. A nuptial pad is present on the first finger. Skin smooth or coarsely shagreened with an irregular scattering of conical tubercles. A distinct but narrow dorsolateral glandular fold extends from behind the eye to the region of the vent. Below this fold is a broad chocolate brown band which runs from the tip of the snout through the nostril, eye and tympanum fading on the flanks. Throat speckled and the vent is immaculate. Dorsum orange in colour without spots; limbs with out bars; a black band along each side of the head and body; upper lip, canthus rostralis and dorsolateral folds white; terminal disks of toes black, lower parts white.

Distribution : Maharashtra, Karnataka, Kerala, Tamil Nadu (Frost, 2010).

Elsewhere : Sri Lanka (Frost, 2010).

Note : Endemic to Western Ghats and Sri Lanka.

57. ***Hylarana malabarica*** (Tschudi, 1838)*
Fungoid Frog

1838. *Rana malabarica* Tschudi, *Classif. Batr.*: **40**, 80.

1859. *Hylarana malabarica* - Gunther, "1858", *Cat. Batr. Sal. Coll. Brit. Mus.*: 131.

1861. *Hydrophylax malabaricus* - Fitzinger, "1860", *Wiss. Wien, Phys. Math. Naturwiss. Kl.*, **42**: 414.

1864. *Hylorana malabarica* - Gunther, *Rept. Brit. India*: 426.

1882. *Rana malabarica* - Boulenger, *Cat. Batr. Sal. Coll. Brit. Mus.*, Ed. **2**: 60.

1920. *Rana (Rana) malabarica* - Boulenger, *Rec. Indian Mus.*, **20**: 9.

1992. *Rana (Hydrophylax) malabarica* - Dubois, *Bull. Mens. Soc. Linn. Lyon*, **61**: 325.

2006. *Hydrophylax malabaricus* - Frost, Grant, Faivovich, Bain, Haas, Haddad, de Sa, Channing, Wilkinson, Donnellan, Raxworthy, Campbell, Blotto, Moler, Drewes, Nussbaum, Lynch, Green, and Wheeler, *Bull. Am. Mus. Nat. Hist.*, **297**: 368.

2007. *Hylarana malabarica* - Che, Pang, Zhao, Wu, Zhao, and Zhang, , *Mol. Phylogenet. Evol.*, **43**: 1-13, by implication.

Diagnosis: Medium sized frogs. Adults can be easily identified by distinctive coloration. Snout obtuse, projecting slightly beyond the mouth. Tympanum very distinct, slightly less or equal to the diameter of the eye. Tips of fingers and toes swollen. First finger longer than second. Tibiotarsal articulation reaches the tympanum or the eye when the leg is held along the body. Heels overlap feebly when the legs are folded at right angles to the body. Toes feebly webbed; two or three phalanges of the fourth toe free. Subarticular tubercles on fingers and toes and the inner metatarsal tubercles large and prominent. Skin smooth or granular above with a distinct dorsolateral glandular fold from above the tympanum to the groin. A shorter fold terminating in a large gland below the tympanum or is continued as a line of glands along the flanks, present. Ventrally granulate on belly and the underside of the thighs. Back bright orange red, yellowish red or crimson, from the tip of the snout to vent, distinctly separated from the black coloration on the flanks starting canthus rostralis; upper lip white and the colour may extend along the line of glands on one sides. Ventrally white, uniform or spotted or marbled with black. Throat and chest often wholly brownish black or black barred or marbled with yellowish white. The barring in some of the young specimens resembles stripes.

Distribution : Western Ghats, Assam and Meghalaya (Dutta, 1997).

Elsewhere : Not known.

Note : Restricted to India.

58. ***Hylarana temporalis*** (Gunther, 1864)
Bronze Frog

1854. *Rana flavescens* Jerdon, "1853", *J. Asiat. Soc. Bengal*, **22**: 531.

1864. *Hylorana temporalis* Gunther, *Rept. Brit. India*: 427.

1870. *Hylorana flavescens* - Jerdon, *Proc. Asiat. Soc. Bengal*, 1870: 83.

1882. *Rana temporalis* - Boulenger, *Cat. Batr. Sal. Coll. Brit. Mus.*, Ed. **2**: 63.

1920. *Rana (Hylorana) temporalis* - Boulenger, *Rec. Indian Mus.*, **20**: 127-130.

1922. *Rana (Hylorana) gracilis montanus* Rao, *J. Nat. Hist. Soc. Bombay*, **28**: 439.

1937. *Rana (Hylorana) intermedius* Rao, *Proc. Indian Acad. Sci., Ser. B*, **6**: 394.

1987. *Rana (Hylarana) temporalis* - Dubois, "1986", *Alytes*, **5**: 42.

1992. *Rana (Sylvirana) temporalis* - Dubois, *Bull. Mens. Soc. Linn. Lyon*, **61**: 326.

2005. *Hylarana temporalis* - Chen, Murphy, Lathrop, Ngo, Orlov, Ho, and Somorjai, *Herpetol. J.*, **15**: 237.

2006. *Sylvirana temporalis* - Frost, Grant, Faivovich, Bain, Haas, Haddad, de Sa, Channing, Wilkinson, Donnellan, Raxworthy, Campbell, Blotto, Moler, Drewes, Nussbaum, Lynch, Green, and Wheeler, Bull. *Am. Mus. Nat. Hist.*, **297**: 370.

Material examined: 1 ex., (ZSIA 10835), Mercara, Sudershan Guest House compound, Dist.- Kodagu, 1-iii-1966; 1 ex., (ZSIA 10688), Kempanahally, 35 Km from F.R.H Murkel, Dist- Kodagu, 09-xi-2003; 2 exs., (ZSIA 10684), Kotrae gate pump house, 8 Km from F.R.H Madikeri, Dist.- Kodagu, 11-xi-2003; 2 exs., (ZSIA 10686), Somerpet, 55 Km. from F.R.H Madikeri, Dist.- Kodagu, 12-xi-2003; 2 exs., (ZSIA 10687), Hudugaon, 41 Km. from Madikeri, F.R.H, Dist.- Kodagu, 12-11-2003; 4 exs., (ZSIA 10689), in and around F.R.H, Medikeri, Dist.- Kodagu, 12- xi-2003; 3 exs., (ZSIA 10685), Belichthru Thodu, Kumber Forest Range, Gundia, Dist.- , 22-xi- 2003. 3 exs., (ZSIA 10049, ZSIA 10063 & ZSIA 10952) stream, Gundia, Dist.- , 18-ix- 2004 & 20-ix-2004; 1 ex., (ZSIA 10194) Ballae halli, Reserve Forest, Agumbe, Dist.- Shimoga, 30-ix-2004; 5 exs., (ZSIA 9077 and ZSIA 9078), Luckunda Estate, Virajpet Dist.- Srimangalanadu, Coorg, 23 viii-1998; 1 ex., WGRC/V/A/676, Halagekerae, BWLS, Chickmagalur, 15.xi.2007; 3 exs., WGRC/V/A/ 727, Bygoor, Chikkamagaluru, 22.v.2005; 2 exs., WGRC/V/A/182, Sollekolly, Coorg, 6.iii.1994; 1 ex., WGRC/V/A/197, Kalliyala, Coorg, 4.iii.1994; 7 exs., WGRC/V/A/583, Hanuman gundi, Chickmagalur, 20.10.05; 1 ex., WGRC/V/A/590, Keraekattae, Chickmagalur, 18.x.2005; 1 ex., WGRC/V/A/654, Tadabehalla, BWLS, Chickmagalur, 11.xi.2006; 1 ex., WGRC/V/A/191, Ottekolly, Coorg, 8.iii.1994; 3 exs., WGRC/V/A/ 196, Chitekanam, Coorg, 4.iii.1994; 3 exs., WGRC/ V/A/200, Nemanckolly, Coorg, 7.iii.1994; 1 ex., WGRC/V/A/211, Kalliyala, Coorg, 4.iv.1994; 3 exs., WGRC/V/A/594, Manikyadhara Betta, Kudremukh National Park, Chickmagalur, 19.x.2005; 1 ex., WGRC/V/A/599, Muduba, Chickmagalur, 21.x.2005; 1 ex., WGRC/V/A/764, Shirgola, Chikkamagaluru, 17.xi.2007.

Diagnosis: Medium sized frogs. Head depressed; snout acute, projecting beyond the mouth; canthus rostralis angular; loreal region strongly concave. Interorbital width broader than upper eyelid. Tympanum very distinct, ¾ the diameter of the eye. Tips of fingers and toes dilated into well developed disks with a distinct circummarginal grove. First finger longer than second. Toes nearly entirely webbed; inner metatarsal tubercle small; no tarsal fold. Tibiotarsal articulation reaches nostril or tip of snout or a little beyond. The heels strongly overlap when the limbs are folded at right angles to the body. Males with internal vocals sacs. Fore limb strong with a pad on the inner side of the first finger, covered during the breeding season with grayish brown velvet like horny layer. Skin smooth; a prominent glandular dorsolateral fold from above the tympanum to the hip. Lower parts smooth.

Distribution : Kerala, Maharashtra, Tamil Nadu and Karnataka (Dutta, 1997 and Biju, 2001).

Elsewhere : Sri Lanka (Frost, 2010).

Note : Endemic to Western Ghats and Sri Lanka.

Family RANIXALIDAE Dubois

Genus ***Indirana*** Laurent

59. ***Indirana beddomii*** (Gunther, 1875)

Beddome's Indian Frog

1876. *Polypedates beddomii* Gunther, "1875", *Proc. Zool. Soc. London, 1875*: 571.

1882. *Rana beddomii* - Boulenger, *Cat. Batr. Sal. Coll. Brit. Mus., Ed.* **2**: 55.

1918. *Rana (Discodeles) beddomi* - Boulenger, *Ann. Mag. Nat. Hist., Ser. 9*, **1**: 238.

1986. *Indirana beddomii* - Laurent, *In Grassé and Delsol (eds.), Traite de Zool.*, **14**: 761.

1987. *Ranixalus beddomii* - Dubois, "1986", *Alytes*, **5**: 69.

1987. *Indirana beddomii* - Dubois, "1986", *Alytes*, **5**: 175-176.

1989. *Rana (Discodeles) beddomii* - Daniel and Sekar, *J. Bombay Nat. Hist. Soc.*, **86**: 194.

Material examined: 2 exs., (ZSIA 10842), Mercara, Sudershan rest house, Dist.-Kodagu, 5.iii.1966; 2 exs., (ZSIA 10057 & 10105), forest floor, Gundia, Dist.- Dakshin Kannada, 17.ix.2004; 1 ex., (ZSIA 10106), Riprarian stream, Gundia, Dist.- Dakshin Kannada, 17.ix.2004; 2 exs., (ZSIA 10122 & 10125), Subramanya, Dist.- Dakshin Kannada, 21.ix.2004; 6 exs., (ZSIA 10126, 10163,10178,10181,10182 &10183), Sampse, Dist.- Chikmagalur, 27.ix.2004; 2 exs., (ZSIA 10209 & 10241), Ballae halli reserve forest, Agumbe, Dist.- Shimoga, 01.x.2004 & 04.x.2004; 5 exs., (ZSIA 10218,10219,10221 & 10222), forest, near Bypass, Agumbae, Dist.- Shimoga, 02.x.2004; 2 exs., (ZSIA 10227 &10228), Microwave station compound, Agumbae, Dist.- Shimoga, 02.x.2004; 1 ex., (ZSIA 10229), Forest near check post, Agumbae, Dist.- Shimoga, 02.x.2004; 1 ex., (ZSIA 10230), Arecanut plantation, Agumbae, Dist.- Shimoga, 02.x.2004; 2 exs., (ZSIA 10231 & 10232), opposite to K.F.D Herbal plantation, Agumbae, Dist.- Shimoga, 03.x.2004; 1 ex., (ZSIA 10250), Jog falls, Dist.- Shimoga, 05.x.2004; 13 exs., (ZSIA 10836), 5 km. from FRH, Talekaveri, Dist.- Kodagu, 15.xi.2003; 3 exs., (ZSIA 10843 & 10880), Bemeanholei hill, east of Subramanya, 6 Km. from Linkeri, 24.xi.2003; 3 exs., (ZSIA 10908), Perambady40 km. from FRH, Medikeri, Dist.- Kodagu, 13.xi.2003; 2 exs., (ZSIA 10904), Mannagunddy, 15 km. south to Gundia FRH, Dist.- Dakshin Kannada, 21.xi.2003.

Diagnosis: Medium sized frogs. This species closely resembles *Indirana leithii* but can be separated from it by the following set of characters: Interorbital space as broad as the upper eye lid; fingers moderate, first at least as long as second; the tibiotarsal articulation reaches the tip of the snout or a little beyond when the leg is held along the body; heels strongly overlap when the limbs are folded at right angles to the body; skin of back with short longitudinal glandular folds; a strong supra tympanic fold from the eye to the shoulder; colour brown above with rather indistinct darker spots, rarely uniform pinkish, sometimes with a light vertebral band; a dark cross band between eyes; a black band along the canthus rostralis and a black temporal spot; limbs more or less distinctly cross barred; lower parts uniform white.

Distribution : Maharashtra, Karnataka, Kerala and Tamil Nadu (Dutta, 1997).

Elsewhere : Not known.

Note : Endemic to Western Ghats.

60. ***Indirana gundia*** (Dubois, 1986)*
Gundia Indian Frog

1986. *Ranixalus gundia* Dubois, "1985", *Alytes*, **4**: 114.

1987. *Indirana gundia* -Dubois, "1986", *Alytes*, **5**: 175.

Diagnosis: Dorsum varies from brown to yellowish, golden, cream, pinkish, reddish, more or less maroon spotted. Some times with a median dorsal band, which is yellowish, cream, golden or orange. Breast and belly yellowish, some time golden in colour, underside of femur translucent, yellowish or pinkish, Tympanum maroon colored; eyes clear, golden in the upper half, much clear silver white in the inferior part, sometimes with a vertical median line. Pupil horizontally oval, prolong in front and behind by a brown or reddish bar which is found in continuity with the deep bars of canthus rostralis and of the supra-tympanic fold.

Distribution : Karnataka (Dutta, 1997).

Elsewhere : Not known.

Note : Endemic to Western Ghats.

61. ***Indirana leithii*** (Boulenger, 1888)
Matheran Indian Frog

1888. *Rana leithii* Boulenger, *Ann. Mag. Nat. Hist., Ser. 6*, **2**: 506.

1918. *Rana (Discodeles) leithii* -Boulenger, *Ann. Mag. Nat. Hist., Ser. 9*, **1**: 238.

1986. *Indirana leithii* -Laurent, *In Grasse and Delsol (eds.), Traite de Zool.*, **14**: 761.

1987. *Ranixalus leithii* -Dubois, "1986", *Alytes*, **5**: 69.

1987. *Indirana leithii* -Dubois, "1986", *Alytes*, **5**: 175-176.

1989. *Rana (Discodeles) leithii* -Daniel and Sekar, *J. Bombay Nat. Hist. Soc.*, **86**: 194.

Material examined: 1 ex., WGRC/V/A/585, Hanuman gundi, Chickmagalur, 20.10.05.

Diagnosis: Small sized frogs. Tongue bifid with a distinct papilla. Head moderate; snout obtuse. Interorbital width a little narrower than the upper eyelid; tympanum ? diameter of the eye. First finger not exceeding quite as far as second; toes ? webbed. Tips of fingers and toes dilated into small disks with circum-marginal groove. Tibiotarsal articulation reaching between the eye and the tip of the snout when leg is held along the body; inner metatarsal tubercle oval; no tarsal fold. Heels overlap when the limbs are folded at right angles to the body. Skin of back with small scattered longitudinal warts; supratympanic fold strong. Brown above with small dark spots; limbs with dark transverse bands, lower parts white; throat mottled with brown.

Distribution : Gujarat, Maharashtra, Karnataka, Kerala and Tamil Nadu (Dutta, 1997).

Elsewhere : Not known.

Note : Endemic to Western Ghats.

62. ***Indirana leptodactyla*** (Boulenger, 1882)
Boulenger's Indian Frog

1876. *Polypedates brevipalmatus* Gunther, "1875", *Proc. Zool. Soc. London, 1875*: 572.

1882. *Rana leptodactyla* Boulenger, *Cat. Batr. Sal. Coll. Brit. Mus., Ed.* **2**: 57.

1920. *Rana (Discodeles) leptodactyla* -Boulenger, *Rec. Indian Mus.*, **20**: 98.

1986. *Indirana leptodactyla* -Laurent, *In Grasse and Delsol (eds.), Traite de Zool.*, **14**: 761.

1987. *Ranixalus leptodactylus* -Dubois, "1986", *Alytes*, **5**: 69.

1987. *Indirana leptodactyla* -Dubois, "1986", *Alytes*, **5**: 175-176.

1989. *Rana (Discodeles) leptodactyla* -Daniel and Sekar, *J. Bombay Nat. Hist. Soc.*, **86**: 194.

Material examined: 1 ex., WGRC/V/A/763, Chowdikattae, BWLS, Chikkamagaluru, 6.xi.2006.

Diagnosis: Small sized frog, tongue with a papilla, head depressed, snout blunt, tympanum ? diameter of the eye. First finger shorter than second. Toes ¼ webbed. Tips of disc dilated into discs. Tibio-tarsal articulation reaching the tip of snout or beyond. Heels overlap when the limbs are folded at right angles to the body. Skin of the back with short longitudinal glandular folds.

Distribution : Karnataka, Kerala and Tamil Nadu (Dutta, 1997).

Elsewhere : Not known.

Note : Endemic to Western Ghats.

63. ***Indirana longicrus*** (Rao, 1937)*
Kempholey Indian Frog

1937. *Philautus longricrus* Rao, *Proc. Indian Acad. Sci., Ser. B*, **6**: 414.

1985. *Philautus crnri* Dutta, *J. Bombay Nat. Hist. Soc.*, **82**: 219.

1993. *Philautus cruri* -Duellman, *Univ. Kansas Mus. Nat. Hist. Spec. Publ.*, **21**: 290.

2001. *Indirana longicrus* -Bossuyt and Dubois, *Zeylanica*, **6**: 50.

Diagnosis: A medium sized frog; head as long as broad; snout obtusely pointed, a little longer than the eye; canthus rostralis prominent; loreal region slightly concave and horizontal; nostrils midway between the eye and the tip of the snout; tympanum distinct and about half the diameter of the eye. Fingers moderately developed subarticular tubercles fairly well developed. Hind limb long, tibiotarsal articulation reaching far beyond the tip of the snout; heels strongly overlap when the limbs are folded at right angles to the body; toes half webbed; a minute elongate inner metatarsal tubercle; subarticular tubercles fairly developed; a faint outer metatarsal tubercle; upper surface of the dorsum with faint small folds, ventral surface smooth.

Distribution : Kempholey, Karnataka (type locality) (Biju, 2001).

Elsewhere : Not known.

Note : Type of this species is found to be lost and it needs type designation from the type locality. Endemic to Karnataka parts of Western Ghats.

64. ***Indirana tenuilingua*** (Rao, 1937)*
Rao's Indian Frog

1937. *Rana (Discodeles) tenuilingua* Rao, *Proc. Indian Acad. Sci., Ser. B*, **6**: 397.

1986. *Indirana tenuilingua* -Laurent, *In Grasse and Delsol (eds.), Traite de Zool.*, **14**: 761.

1987. *Ranixalus tenuilingua* -Dubois, "1986", *Alytes*, **5**: 69.

1987. *Indirana tenuilingua* -Dubois, "1986", *Alytes*, **5**: 175-176.

Diagnosis: Dorsum pale brown and the lateral sides dark in colour, upper surface of the snout is white. A dark band from the tip of the snout to the loreal region, another from tympanum to shoulder. Lower jaw bears dark and white longitudinal bands. Dorsal surface covered with fine cutaneous folds. Ventral surface smooth. Head slightly broader than long. Tympanum distinct and about two thirds the diameter of the eye. Throat pale yellowish and the ventral region of the thighs reddish in colour. A number of dark bars present on the limbs, fingers as well as on the toes. Fingers short with dilated and truncated discs. First and second finger nearly equal in size, third longest. Sub-articular tubercles indistinct. Hind limb long, toes short with truncated discs, toes three fourth webbed. A feebly developed inner-metatarsal tubercle and a very small outer metatarsal tubercle present.

Distribution : Known from type locality (Forests of Kempholey, Sakaleshpur, Hassan, and Karnataka) only.

Elsewhere : Not known.

Note : Type of this species is found to be lost and it needs type designation from the type locality. Endemic to Karnataka parts of Western Ghats.

Family RHACOPHORIDAE Hoffman

Sub-Family RHACOPHORINAE Hoffman

Genus ***Polypedates*** Tschudi

65. ***Polypedates maculatus*** (Gray, 1833)

Chunam Frog

1833. *Hyla maculata* Gray, *Ill. Indian Zool.*: *pl.* 82.

1838. *Bürgeria maculata* Tschudi, *Classif. Batr.*: **34**, 75.

1838. *Hyla Reynoudi* Tschudi, *Classif. Batr.*: **34**, 75.

1859. *Polypedates maculatus* -Gunther, "1858", *Cat. Batr. Sal. Coll. Brit. Mus.*: 78.

1882. *Rhacophorus maculatus* -Boulenger, *Cat. Batr. Sal. Coll. Brit. Mus.*, Ed. **2**: 83.

1901. *Rhacophorus acanthostomus* Werner, *Zool. Anz.*, **24**: 98.

1912. *Rhacophorus maculatus himalayensis* Annandale, *Rec. Indian Mus.*, **8**: 14.

1927. *Rhacophorus (Polypedates) maculatus* -Bourret, *Fauna Indochine, Vert.*, **3**: 264.

1931. *Rhacophorus (Rhacophorus) acanthostomus* -Ahl, *Das Tierreich*, **55**: 120.

1931. *Rhacophorus (Rhacophorus) maculatus* -Ahl, *Das Tierreich*, **55**: 133.

1931. *Rhacophorus (Rhacophorus) acanthostomus* -Ahl, *Das Tierreich*, **55**: 137.

1931. *Rhacophorus (Rhacophorus) leucomystax himalayensis* -Ahl, *Das Tierreich*, **55**: 137.

1936. *Rhacophorus leucomystax maculatus* -Wolf, *Bull. Raffles Mus.*, **12**: 181.

1987. *Rhacophorus (Rhacophorus) maculatus himalayensis* -Dubois, "1986", *Alytes*, *5*: 84-85.

Material examined: 1 ex., WGRC/V/A/761, Saave, BWLS, Chikkamagaluru, 5.xi.2006.

Diagnosis: A slender medium sized frog, vomerine teeth present, snout acuminate, canthus rostralis distinct, interorbital width broader than the upper eyelid; tympanum about ¾ the diameter of the eye; first finger as long as second; fingers with rudiment of web; toes ¾ webbed; tips of fingers and toes with dilated disks; subarticular tubercle distinct; inner metatarsal tubercle prominent; tibiotarsal articulation reaches the nostrils; heels strongly overlap when folded to at right angles to the body. Brownish yellow or grayish above with darker spots; hinder side of the thighs with round yellow spots on a brownish background (Chanda, 2002).

Distribution : Throughout India (Dutta, 1997).

Elsewhere : Bangladesh and Sri Lanka (Frost, 2010).

66. ***Polypedates occidentalis*** Das and Dutta, 2006

Charpa Tree Frog

2006. *Polypedates occidentalis* Das and Dutta, *J. Herpetol.*, **40**: 215.

Material examined: 1 ex., WGRC/V/A/670, Bygoor, Chickmagalur, 13.viii.2007.

Diagnosis: A medium sized tree frog; head relatively long and wide; snout obtusely pointed; nostril closer to tip of snout than to eye; canthus rostralis flattened

in transverse section; loreal region slightly concave; interorbital distance greater than width of upper eyelid; distinct supratympanic fold from posterior corner of upper eyelid; tympanum distinct; vomerine teeth present; tongue smooth, lacking median conical lingual papilla. Forelimbs relatively short; tips of fingers dilated into large, flattened, rounded disks with circum-marginal grooves; fingers webbed basally, most extensive webbing between fingers I and II; all fingers with dermal fringes on inner and outer aspects; no dermal fringe on elbow; large unpigmented nuptial pads on dorsal surfaces of fingers I and II. Hind limbs relatively long; tibia long; tips of toes dilated into flattened disks with circummarginal grooves; webbing medium; distinct inner metatarsal tubercle present; outer metatarsal tubercle absent. Dorsum smooth, lacking tubercles; outer edge of upper eyelids with smooth granules; throat with longitudinal pleated skin; abdominal regions granular, with large rounded tubercles; undersurface of forelimbs and the undersurface of thighs smooth; posterior surface of hind limbs with large, rounded tubercles. Dark brown hourglass shaped marking present on dorsum, commencing in interorbital region, narrowing in occipital region, and widening so as to terminate as a three pronged figure at about mid length of body; rest of dorsum yellow brown, with gray brown blotches; dark brown line from posterior of orbit to the upper level of axilla, fragmenting into two or three blotches on flanks; fore- and hind limbs with dark brown bars; posterior surface of thigh with brownish-yellow and dark brown reticulations; venter cream, except the dark brown mottlings on throat (Das and Dutta, 2006).

Distribution : Known from Kerala (Dinesh *et al.,* 2009) and Karnataka (in press).

Elsewhere : Not known.

Note : Endemic to Western Ghats.

67. ***Polypedates pseudocruciger*** Das and Ravichandran, 1998

False Hour-glass Tree Frog

1998. *Polypedates pseudocruciger* Das and Ravichandran, "1997", *Hamadryad*, **22**: 89.

Material examined: 4 exs., (ZSIA 9082), Luckunda Estate, Virajpet Dist.- Srimangalanadu, Coorg, 23 viii-1998; 1 ex., (ZSIA 10161), Samse Kalasa, Dist:-Chikmagalur, 27-ix-2004.

Diagnosis: Dorsum yellowish gray, with scattered dark brown spots on snout and fine scattered tubercles. Ventral side unpatterned pale yellow. Postorbital and sacral regions and lateral aspect of torso. A dark brown stripe along supratympanic fold. Limbs with dark gray crossbars. Skin over cranium free; snout obtusely pointed, slightly rounded, nostrils oval, eye diameter slightly less than eye nostril distance. Interorbital distance greater than that of upper eyelid. Tympanum distinct, oval, flat, situated closer to orbit. A distinct supratympanic fold from posterior edge of upper eyelid, to beyond insertion of forelimb. Forelimbs long, tips of fingers dilated into large flattened, rounded disks with circummarginal grooves. First and second finger unwebbed, third and fourth with weak webbing. Outer edge of fingers IV and I with an arrow dermal fringe. Sub-articular tubercles on palms large, rounded, larger than those on foot. Hindlimbs long, tips of the toes dilated in to flattened disks with circummarginal groove and smaller than on fingers. Broad webbing on toe. A small but distinct and elongated inner-metatarsal tubercle present.

Distribution : Tamil Nadu and Karnataka (Biju, 2001).

Elsewhere : Not known.

Note : Endemic to Western Ghats.

Genus ***Pseudophilautus*** Laurent

68. ***Pseudophilautus amboli*** (Biju and Bossuyt, 2009)

Amboli bush frog

2009. *Philautus akroparallagi* Biju and Bossuyt, *Zoological Journal of the Linnean Society*, **155**, 374-444.

2010. *Pseudophilautus amboli*- Li, Che, Murphy, Zhao, Zhao, Rao, and Zhang, 2009, Mol. Phylogenet. Evol., **53**: 519.

Material examined: 1 ex., WGRC/V/A/694, Chorla, Belgaum, 4th to 6th viii 2009.

Diagnosis: Medium-sized frog with a rather robust body; dorsum uniform blackish brown. Head length nearly equal to width; outline of snout in dorsal and ventral views pointed, snout length slightly longer than horizontal diameter of eye; canthus rostralis indistinct, loreal region acute to obtuse; tympanum distinct; supra-tympanic fold distinct, from posterior corner of upper eyelid to near the shoulder; tongue without lingual papilla. Forelimbs and hindlimb with obscure brownish black cross bands; ventral side light grayish with variable size of brownish gray specks, especially on the side of limbs. Throat distinctly lemon yellow with blackish specks, foot and hand grayish, webbing grayish forelimbs and hindlimb with obscure brownish black cross bands; ventral side light grayish with variable size of brownish gray specks, especially on the side of limbs.

Distribution : Western Ghats parts of Maharashtra and Karnataka (Biju and Bossuyt, 2009).

Elsewhere : Not known.

Note : Endemic to Western Ghats.

Genus ***Raorchestes*** Biju, Shouche, Dubois, Dutta and Bossuyt

69. ***Raorchestes bombayensis*** (Annandale, 1919)
Maharashtra Bush Frog

1919. *Ixalus bombayensis* Annandale, *Rec. Indian Mus.*, **16**: 124.

1931. *Rhacophorus (Philautus) bombayensis* - Ahl, *Das Tierreich*, **55**: 79.

1974. *Philautus bombayensis* - Gorham, *Checklist World Amph.*: 166.

2001. *Philautus (Philautus) bombayensis* - Bossuyt and Dubois, *Zeylanica*, **6**: 41.

2010. *Raorchestes bombayensis* - Biju, Shouche, Dubois, Dutta and Bossuyt, *Current Science*, **98** (8): 119-1125.

Material examined: 1 ex., WGRC/V/A/693, Chorla, Belgaum, 4th to 6th viii 2009.

Diagnosis: Dorsum dark brown; venter greenish -yellow; skin more or less rough with small-scattered warts. Nostril closer to tip of snout than to eye. Inter-orbital width broader than diameter of eye; tympanum hidden; tongue with inconspicuous papillae. Fingers free, toes one-third webbed; sub-articular tubercles moderately large. Tibiotarsal articulation reaching anterior corner of eye; inner metatarsal tubercle present.

Distribution : Found in Western Ghats parts of Karnataka and Maharashtra (Biju and Bossuyt, 2009).

Elsewhere : Not known.

Note : Endemic to Western Ghats.

70. ***Raorchestes charius*** (Rao, 1937)
Seshachar's Bush Frog

1937. *Philautus charius* Rao, *Proc. Indian Acad. Sci., Ser. B*, **6**: 405.

2001. *Philautus (Philautus) charius* - Bossuyt and Dubois, *Zeylanica*, **6**: 48.

2010. *Raorchestes charius* - Biju, Shouche, Dubois, Dutta and Bossuyt, *Current Science*, **98** (8): 119-1125.

Material examined: 3 ex., WGRC/V/A/728, Kemmanugundi, Chikkamagaluru, 5.iii.2009.

Diagnosis: Medium sized bush frog, head broader than long, snout rounded, canthus rostralis rounded, loreal region slightly concave, nostrils closer to tip of snout, tympanum rather indistinct, 35 % of eye diameter. Vomerine ridge present, tongue bearing no lingual papilla, supratympanic fold distinct. Forearm shorter than hand; fingers moderately long; tips of fingers with well-developed disks with distinct circummarginal grooves; dermal fringe on inside of all fingers, subarticular tubercles prominent, prepollex distinct, oval; two palmar tubercles; supernumerary tubercles present on all fingers. Hind limbs moderately long, heels barely in touch when limbs are folded at right angles to body; tibia shorter than thigh; tips of all toes with moderate disks with distinct circummarginal grooves; webbing present, subarticular tubercles distinct; inner metatarsal tubercle distinct; supernumerary tubercles present. Skin on the side of head smooth; anterior and posterior part of back with small horny spinules, upper part of flanks shagreened. Dorsal part of forelimb, thigh, tibia and tarsus smooth; throat,

chest, belly and ventral part of thighs granular. Head with a light brown triangle from tip of snout to between eyes and with an inter-ocular dark brown cross-bar, dorsum with a dark cross mark, flanks grayish, groin grey with large pale yellow spots, loreal region dark brown, tympanic region and tympanum grayish. Forelimb, dorsal part of thigh, tibia and foot grayish with some darker bands, posterior part of thigh grey with some round pale yellow spots. Throat and margin of throat marbled with grey, chest, belly, ventral part of thighs and webbing whitish. Vocal sacs present; a pair of distinct, rounded openings at base of jaw. Secondary sexual character: horny spinules on back (Bossuyt and Dubois, 2001).

Distribution : Found in Western Ghats parts of Karnataka (Biju and Bossuyt, 2009).

Elsewhere : Not known.

Note : Endemic to Western Ghats.

71. ***Raorchestes chromasynchysi*** (Biju and Bossuyt, 2009)
Confusing green bush frog

2009. *Philautus chromasynchysi* Biju and Bossuyt, *Zoological Journal of the Linnean Society*, **155**, 374-444.

2010. *Raorchestes chromasynchysi* - Biju, Shouche, Dubois, Dutta and Bossuyt, *Current Science*, **98** (8): 119-1125.

Material examined: 1 ex., WGRC/V/A/690, Kemmanugundi, Chickmagalur, 05.iii.2009; 3 exs., WGRC/V/A/709, Kemmanugundi, Chickmagalur, 5.iii.2009; 6 exs., WGRC/V/A/712, Kemmanugundi, Chickmagalur, 22.xi.2007.

Diagnosis: A small to medium sized frog with a slender body; head length subequal to head width; snout slightly pointed and protruding; tongue with a free pointed papilla; canthus rostralis sharp; loreal region vertical, marginally concave; tympanum distinct; supratympanic fold distinct; forelimb shorter that hand; webbing in fingers absent; palmar tubercle and subarticular tubercle distinct; super-numerary tubercles present; nuptial pad absent; tibia length sub-equal to thigh; webbing moderate (I 1-2 II 1-2 III 1-2 IV 2-1 V); super-numerary tubercles present; skin on the dorsum smooth to sparsely granular but on the ventral side of the belly finely granular (Biju and Bossuyt, 2009).

Distribution : Kerala (Biju and Bossuyt, 2009) and Bhadra Wildlife Sanctuary, Karnataka (in press).

Elsewhere : Not known.

Note : Endemic to Kerala and Karnataka parts of Western Ghats.

72. ***Raorchestes flaviventris*** (Boulenger, 1882)*
Hassan Bush Frog

1882. *Ixalus flaviventris* Boulenger, *Cat. Batr. Sal. Coll. Brit. Mus., Ed.* **2**: 105.

1931. *Rhacophorus (Philautus) flaviventris* - Ahl, *Das Tierreich*, **55**: 78.

1937. *Philautus montanus* Rao, *Proc. Indian Acad. Sci., Ser. B*, **6**: 415.

1974. *Philautus flaviventris* - Gorham, *Checklist World Amph.*: 166.

1985. *Philautus hassanensis* Dutta, *J. Bombay Nat. Hist. Soc.*, **82**: 220.

2001. *Philautus (Philautus) flaviventris* - Bossuyt and Dubois, *Zeylanica*, **6**: 30.

2010. *Raorchestes flaviventris* - Biju, Shouche, Dubois, Dutta and Bossuyt, *Current Science*, **98** (8): 119-1125.

Diagnosis: A medium sized bush frog, head broader than long; lightly convex above; snout rounded; canthus rostralis rounded, loreal region slightly concave; nostrils oval without flap of skin laterally, closer to tip of snout than to eye; tympanum rather distinct, rounded; vomerine ridge present; tongue with a conical lingual papilla; supratympanic fold distinct, from back of eye to shoulder; tips of all fingers with well-developed disks, with distinct circummarginal grooves; fingers without dermal fringe; webbing at base of fingers rudimentary; hind limbs moderately long, heels in touch when limbs are folded at right angles to body; tips of all toes with moderate disks, smaller than those of fingers, with distinct circummarginal grooves; webbing present, medium; inner metatarsal tubercle distinct.

Distribution : Known only from original description (Malabar) (Biju and Bossuyt, 2009).

Elsewhere : Not known.

Note : Endemic to Western Ghats.

73. ***Raorchestes glandulosus*** (Jerdon, 1854)

Beautiful Bush Frog

1854. *Ixalis ? glandulosa* Jerdon, "1853", *J. Asiat. Soc. Bengal*, **22**: 532.

1870. *Ixalus glandulosa* - Jerdon, *Proc. Asiat. Soc. Bengal*, 1870: 85.

1876. *Ixalus glandulosus* - Gunther, "1875", *Proc. Zool. Soc. London*, 1875: 573.

1882. *Ixalus pulcher* Boulenger, *Cat. Batr. Sal. Coll. Brit. Mus.*, Ed. **2**: 469.

1927. *Rhacophorus noblei* Ahl, *Sitzungsber. Ges. Naturforsch. Freunde Berlin*, 1926: 40.

1927. *Rhacophorus pulcherrimus* Ahl, *Sitzungsber. Ges. Naturforsch. Freunde Berlin*, 1926: 41.

1928. *Philautus glandulosus* - Roux, *Rev. Suisse Zool.*, **38**: 465.

1931. *Rhacophorus (Philautus) glandulosus* - Ahl, *Das Tierreich*, **55**: 71.

1931. *Rhacophorus (Philautus) noblei* - Ahl, *Das Tierreich*, **55**: 55, 100.

1931. *Rhacophorus (Philautus) pulcherrimus* - Ahl, *Das Tierreich*, **55**: 55, 101.

1937. *Philautus pulcher* - Rao, *Proc. Indian Acad. Sci., Ser. B*, **6**: 423.

1974. *Philautus noblei* - Gorham, *Checklist World Amph.*: 167.

1974. *Philautus pulcherrimus* - Gorham, *Checklist World Amph.*: 167.

2001. *Philautus (Philautus) glandulosus* - Bossuyt and Dubois, *Zeylanica*, **6**: 15.

2010. *Raorchestes glandulosus* - Biju, Shouche, Dubois, Dutta and Bossuyt, *Current Science*, **98** (8): 119-1125.

Material examined: 1 ex., WGRC/V/A/686, Aldur, Chickmagalur, 18.vii.2009.

Diagnosis: A small frog with color varying from green to dark purple with uniform or distinct markings dorsally. Ventral surface immaculate more or less spotted. Dorsal skin generally smooth, sometimes with a number of small indistinct tubercles. Lateral sides of the body generally granular. A cutaneous fold extending from the eye to shoulder. Head moderately large. Snout rounded and as long as the diameter of the eye. Canthus rostralis distinct. Nostrils equidistant from the eye and tip of snout. Interorbital width broader than the diameter of the eye. Tympanum hidden. Forelimbs moderately long. Fingers free. Hind limbs long. Tibiotarsal articulation reaching eye or slightly beyond. Toes webbed at base. Tips of toes dilated into small rounded disks. A small inner metatarsal tubercle present. Outer metatarsal tubercle absent.

Distribution : Found in Western Ghats parts of Karnataka and Kerala (Biju and Bossuyt, 2009).

Elsewhere : Not known.

Note : Endemic to Western Ghats.

74. ***Raorchestes luteolus*** (Kuramoto and Joshy, 2003)

Coorg Yellow Bush Frog

2003. *Philautus luteolus* Kuramoto and Joshy, *Curr. Herpetol.*, **22**: 52.

2010. *Raorchestes luteolus* - Biju, Shouche, Dubois, Dutta and Bossuyt, *Current Science*, **98** (8): 119-1125.

Material examined: 1 ex., WGRC/V/A/687, Bygoor, Chickmagalur, 23.vi.2009; 9 exs., WGRC/V/A/710, Rashigudda, BWLS, Chickmagalur, 16.xi.2006.

Diagnosis: Medium sized bush frogs, width of head broader than head length; snout pointed; canthus rostralis rounded; nostrils oval, nearer tip of snout than eye; vomerine ridge absent; pupil rounded with blue ring on the outer margin; tympanum indistinct; tongue bifid without papilla. Forearm less than hand length, finger tips with well-developed disks wit circum-marginal grooves, fingers with dermal fringes on both edges. Hindlimbs long, heels do not overlap when folded at right angles to the body; tibia shorter than femur and longer than foot; toe disk well developed; webbing distinct and medium; tibiotarsal articulation reaches anterior border of eye. Dorsum yellow or yellowish brown, usually with four-six faint brownish discontinuous lines from snout to vent; loreal and tympanic regions golden yellow or yellowish brown (Biju and Bossuyt, 2009).

Distribution : Found in Western Ghats parts of Karnataka (Biju and Bossuyt, 2009).

Elsewhere : Not known.

Note : Endemic to Western Ghats. Biju and Bossuyt (2009) examined the type series of *P. neelanethrus* and the published sequence of the 16S rRNA gene and could not find any substantial difference with *P. luteolus*; therefore they considered *P. neelanethrus* as a new synonym of *P. luteolus*.

75. ***Raorchestes neelanethrus*** (Gururaja, Aravind, Ali, Ramachandra, Velavan, Krishnakumar and Aggarwal, 2007)*

Blue-eyed Yellow Bush Frog

2007. *Philautus neelanethrus* Gururaja, Aravind, Ali, Ramachandra, Velavan, Krishnakumar and Aggarwal, *Zoological Science*, **24**, 525-534.

2010. *Raorchestes neelanethrus* - Biju, Shouche, Dubois, Dutta and Bossuyt, *Current Science*, **98** (8): 119-1125.

Diagnosis: A small-sized bush frog; head broader than width; snout pointed in total profile, protruded slightly beyond mouth; snout length is equal or subequal to diameter of eye; canthus rostralis angular, loreal region slightly concave; nostrils oval, nearer tip of snout than eye; eyes protruding, prominent, pupil rounded, horizontal, with blue ring on the outer margin; tympanum indistinct; tongue bifid, without papilla; supratympanic fold absent; unpigmented single vocal sac present; forearm less than hand length; finger tips with well-developed disks with distinct circum-marginal grooves; webbing in hand absent; sub-articular tubercles prominent, rounded and single, pre-pollex tubercle oval, distinct; hindlimb long, heels do not overlap when folded at right angles to the body; tibiotarsal articulation reaches anterior border of eye; tibia shorter than femur; webbing distinct and medium; inner metatarsal tubercle present.

Distribution : Known from the surroundings of type locality (Arodi, Sharavathi river basin, Shimoga, Karnataka).

Elsewhere : Not known.

Note : Endemic to Western Ghats region. Biju and Bossuyt (2009) consider it to be synonym with *P. luteolus*. Further confirmation needed with considering sequences of both specimens (pers. comm. on consultation with the authors of *P. neelanethrus*)

76. ***Raorchestes tuberohumerus*** (Kuramoto and Joshy, 2003)

Kudremukh Bush Frog

2003. *Philautus tuberohumerus* Kuramoto and Joshy, *Curr. Herpetol.*, **22**: 55.

2010. *Raorchestes tuberohumerus* - Biju, Shouche, Dubois, Dutta and Bossuyt, *Current Science*, **98** (8): 119- 1125.

Material examined: 1 ex., WGRC/V/A/688, Bygoor, Chickmagalur, 23.vi.2009; 1 ex., WGRC/V/A/695, Agumbe, Shimoga, 11.viii.2009.

Diagnosis: A small frog with brown to dark dorsal color and conspicuous yellow spots on the anterior surface of the thigh and with large yellow or reddish yellow markings near groin. Snout slightly pointed, canthus rostralis rounded. Loreal region slightly concave or flat; nostril nearer to tip of snout than to eye, and protruding beyond the line between tip of snout and anterior corner of eye when viewed from above. Interorbital width much wider than the upper eyelid. Tympanum small and indistinct, less than the diameter of the eye. Supratympanic fold distinct. No papilla on the tongue. Palm longer than forearm and with a bony projection on the underside of the humerus bone, which is unique to this species. Fingers with large disks with circummarginal groove, no web between fingers. Subarticular and palmar tubercles well developed. Rudimentary web between toes. Inner metatarsal tubercle moderate; no outer metatarsal tubercle; no tarsal fold. Heels overlap when folded at right angles to the body. Dorsal surface coarsely granulated but, lower surface finely granulated.

Distribution : Found in Western Ghats parts of Karnataka and Kerala (Biju and Bossuyt, 2009).

Elsewhere : Not known.

Note : Endemic to Karnataka and Kerala parts of Western Ghats.

Genus ***Rhacophorus*** Kuhl and Van Hasselt

77. ***Rhacophorus lateralis*** Boulenger, 1883

Small Tree Frog

1883. *Rhacophorus lateralis* Boulenger, *Ann. Mag. Nat. Hist., Ser. 5*, **12**: 162.

1931. *Rhacophorus (Rhacophorus) lateralis* - Ahl, *Das Tierreich*, **55**: 165.

Material examined: 1 ex., WGRC/V/A/667, Bygoor, Chickmagalur, 13.viii.2007; 1 ex., WGRC/V/A/678, Magundi, Chickmagalur, 14.xiii.2007.

Diagnosis: Medium sized frog, habitus slender; head short, broader than long; snout short, obtusely pointed, projecting beyond mouth; canthus rostralis distinct; loreal region slightly concave; vomerine teeth in two small oblique series between the choanae; nostrils nearer to the tip of the snout than to the eye; interorbital space broader than the upper eyelid; eyes large; tympanum half the diameter of the eye; a supratympanic fold distinct; fingers and toes with enlarged disc possessing circummarginal grooves; fingers and toes with dermal fringes and more than half webbed; subarticular tubercles not very prominent; a fold of the skin bordering the forelimb anteriorly; tibiotarsal articulation reaching the tip of the snout; dorsum smooth, belly granular; a prominent dorsolateral yellow streak on each side from the nostril to the groin along the outer edge of the upper eyelid. Dorsum green interspersed with fine sky blue spots; a distinct metallic yellow lateral stripe running from eye to the groin (Das, 2000).

Distribution : Karnataka and Kerala (Das, 2000).

Elsewhere : Not known.

Note : Endemic to Karnataka and Kerala parts of Western Ghats.

78. ***Rhacophorus malabaricus*** Jerdon, 1870
Malabar Flying Frog

1870. *Rhacophorus malabaricus* Jerdon, *Proc. Asiat. Soc. Bengal*, 1870: 84.

1931. *Rhacophorus (Rhacophorus) malabaricus* - Ahl, *Das Tierreich*, **55**: 159.

Material examined: 4 exs., (ZSIA 9083), Luckunda Estate, Virajpet Dist.- Srimangalanadu, Coorg, 23.viii.-1998.

Diagnosis: Medium sized frogs with vomerine teeth in two straight series; snout sub acuminate; canthus rostralis obtuse; loreal region concave; nostril nearer the end of the snout than eye; inter orbital width broader than upper eyelid; tympanum ? the diameter of the eye. Fingers and toes webbed to the disk; disk as large as the tympanum. Subarticular tubercles well developed. Tibiotarsal articulation reaches the eye or nostril. Heels overlap when the legs are folded at right angle to the body. Skin finely granular above, more coarsely beneath; granules under the thigh intermixed with larger ones; outer border of forearm and tarsus with a dermal fold; heel with a triangular dermal process. Green above often speckled all over with black and white. Lower parts whitish. Web between fingers and toes reddish.

Distribution : Kerala, Karnataka and Goa (Dutta, 1997).

Elsewhere : Not known.

Note : Endemic to Western Ghats.

Order GYMNOPHIONA Muller
Family CAECILIIDAE Rafinesque
Genus ***Gegeneophis*** Peters

79. ***Gegeneophis carnosus*** (Beddome, 1870)*
Periah Peak Caecilian

1870. *Epicrium carnosum* Beddome, *Madras Month. J. Med. Sci.*, **2**: 176.

1870. *Gegenes carnosus* - Günther, <http://research.amnh.org/herpetology/amphibia/names.php?year=1876> "1875", *Proc. Zool. Soc. London*, 1875: 577.

1880. *Gegeneophis carnosus* - Peters, "1879", *Monatsber. Preuss. Akad. Wiss. Berlin*, 1879: 932.

1882. *Gegenophis carnosus* - Boulenger, *Cat. Batr. Grad. Batr. Apoda Coll. Brit. Mus.*, Ed. **2**: 101.

Diagnosis: Body light pink coloured throughout. Head oval and slender. Snout projecting beyond mouth. Eyes invisible, if present buried under the skull bones. Tentacular area somewhat swollen, the foramen not visible from above but small lateral elevations marks its position. Nostrils nearly terminal and not visible directly from above the head. Two collars, the first moderately distinct, delineated by the first and second nuchal grooves. The posterior terminus of the body with an un-segmented 'shield', on the underside of which is the transverse vent. Dental series in four rows. The tongue bears two

narial plugs. The choanae directed outward and forward.

Distribution : Karnataka and Kerala (Pillai and Ravichandran, 2005).

Elsewhere : Not known.

Note : Endemic to Karnataka and Kerala parts of Western Ghats.

80. ***Gegeneophis goaensis*** Bhatta, Dinesh, Prashanth and Kulkarni, 2007
Goa Caecilian

2007. *Gegeneophis goaensis* Bhatta, Dinesh, Prashanth and Kulkarni, *Zootaxa*, **1409**: 51-59.

Material examined: 1 ex., WGRC/V/A/714, Chorla, Belgaum, 05.viii.2009.

Diagnosis: A small sized caecilian, body in life is sub-cylindrical and slightly dorso-ventrally compressed; body is almost uniform in its width throughout the length; in dorsal view, the head tapers strongly from the level of the occiput to the tentacular apertures, anteriorly, the head tapers and terminates in a bluntly rounded but narrow snout tip; nostrils are slightly closer to the level of the snout tip; nostrils are visible dorsally and laterally but not ventrally; eyes are situated under bone are visible to the naked eye in life but not in the preserved specimen; dentition, 18 premaxillary-maxillary, 19 vomeropalatine, 17 dentary, and 4 splenial teeth; there are 120 primary annuli and more than 75 of which are marked with secondary annular grooves; vent is surrounded by eight denticles; rounded terminus ends in a cap that is completely demarcated by the last primary annular groove.

Distribution : Known from Goa (Ganv Kond, Keri, Sattari, Goa) and Karnataka (in press).

Elsewhere : Not known.

Note : Endemic to Goa and Karnataka parts of Western Ghats.

81. ***Gegeneophis krishni*** Pillai and Ravichandran, 2005*
Gurupur Caecilian

1999. *Gegeneophis krishni* Pillai and Ravichandran, *Rec. zool. Surv. India, Occas. Pap.*, **172**: 87.

Diagnosis: It is a thin small, worm like body measuring 195mm in length and 3.5mm. in width. In preservative the colour of dorsal side is brownish with steel blue tint. The dorsal part of the tail darker than the rest of the body. Ventrally brownish with a pale circular patch around the vent. Skin dotted with whitish glands both dorsally and ventrally. Head about as wide as the body, long; snout blunt, projecting beyond the lower jaw. Eyes invisible; nostril lateral, barely visible from above. Tentacle slightly behind and below the nostril. Collars fairly clear, the second collar almost twice wider laterally compressed to the first. First nuchal groove, clearly seen on the throat and sides, just cross the dorsum. Second nuchal groove pronounced ventrally, distinct laterally and meet dorsally. Third nuchal groove is comparatively dim above and on sides, not meeting ventrally, the second collar being fused with the first body segment. Behind collars are 125 primary and 15 secondary folds. Vent transverse, a large circular whitish patch surrounds the vent. Terminal shield bluntly rounded. Scales are present from the anterior folds of the body. Four series of teeth premaxillary-maxillary, 12-12; prevomeropalatine, 11-11; dentary, 6-6 and splenial, 2-2. Tongue oval, does not cover the splenial teeth. Two circular narial plugs against two choanae.

Distribution : Known from type locality (Krishna Farms, Gurpur, South Canara, Karnataka) only.

Elsewhere : Not known.

Note : Endemic to Karnataka parts of Western Ghats.

82. ***Gegeneophis madhavai*** Bhatta and Srinivasa, 2004
Mudur Caecilian

2004. *Gegeneophis madhavai* Bhatta and Srinivasa, *Zootaxa*, **644**: 2.

2006. *Gegeneophis madhavaorum* - Das, *Herpetol. Rev.*, **37**: 154.

Material examined: 1 ex., WGRC/V/A/574, Kundapur, Udupi.

Diagnosis: A large sized caecilian, body in life is sub-cylindrical and slightly dorso-ventrally compressed; body is not uniform in its width

throughout the length; in dorsal view, the head tapers strongly from the level of the occiput to the tentacular apertures; posterior region of the head at jaw angle is slightly narrower than the nuchal region; snout projects beyond the mouth; nostrils are slightly closer to the level of the snout tip than to the anterior most margin of the mouth; nostrils visible dorsally and laterally but not ventrally; tentacular apertures are visible in both dorsal and ventral views and are much closer to the margin of the upper lip than to the top of the head; eyes, which are scarcely visible in life, are not visible in the preserved specimen; dentition, 25 premaxillary-maxillary (13 left, 12 right), 22 vomeropalatine, 19 dentary (9 left, 10 right) and 4 splenial teeth (including empty sockets); nuchal region is broader and higher than the adjacent parts of the body; two nuchal collars are marked clearly by three nuchal grooves; annuli are marked by whitish colored grooves, which are more conspicuous posteriorly; primary annuli 97 with more than 25 secondary annuli which are confined to the posterior of the body; vent is surrounded by ten denticles; rounded terminus ends in a cap that is completely demarcated by the last primary annular groove.

Distribution : Known from type locality (Doddinaguli, Mudur, Kundapura, Udupi, Karnataka) only.

Elsewhere : Not known.

Note : Endemic to Western Ghats.

83. ***Gegeneophis mhadeiensis*** Bhatta, Dinesh, Prashanth and Kulkarni, 2007

Mhadei Caecilian

2007. *Gegeneophis mhadeiensis* Bhatta, Dinesh, Prashanth and Kulkarni, *Curr. Sci.,* **93(10)**: 1442-1445.

Material examined: 1 ex., WGRC/V/A/640, Chorla, Belgaum, July 2006; 1 ex., WGRC/V/A/715, Chorla, Belgaum, 5.viii.2009; 2 exs., WGRC/V/A/716, Maan, Belgaum, 7.viii.2009.

Diagnosis: A small sized worm like caecilian, body in life is sub-cylindrical and slightly dorso-ventrally compressed, though almost uniform in its width throughout ; in dorsal view, the head tapers strongly from the level of the occiput to the tentacular apertures, anteriorly, the head tapers and terminates in a bluntly rounded but narrow snout tip; posterior part of the head is slightly narrower than the nuchal region; in lateral view, the top of the head is straight and without any strong bulges; margin of the upper lip is slightly arched; in ventral view, the anterior margin of the lower jaw is more broadly rounded than the anterior margin of the snout; nostrils are close to the front of the snout tip, and are visible dorsally and laterally but not ventrally; tentacular apertures are circular, lateral in position, visible in both dorsal and ventral views, and much closer to the margin of the upper lip than to the top of the head; eyes lie beneath the bone and are visible in life; dentition, 21 premaxillary-maxillary, 20 vomeropalatine, 14 dentary and four splenial teeth; nuchal region is broader and higher than the adjacent parts of the body, the two collars are marked clearly by three nuchal grooves, nuchal grooves are complete with the exception of the third, which is incomplete mid-ventrally; primary annuli was ranges from 118 to 125 while secondary annuli were making their appearance in the range of 87th to 98th primary annuli and total number of secondary annuli were in the range of 24 to 32; six secondary grooves in front of the vent are complete; transverse vent is surrounded by ten denticles; rounded terminus ends in a small cap that is completely demarcated by the last secondary annular groove.

Distribution : Known from type locality (the surroundings of Rameshwar temple (Chorla Village), Khanapur, Belgaum, Karnataka) only.

Elsewhere : Not known.

Note : Endemic to Western Ghats.

84. ***Gegeneophis nadkarnii*** Bhatta and Prashanth, 2004

Nadkarnii Caecilian

2004. *Gegeneophis nadkarnii* Bhatta and Prashanth, *Curr. Sci.,* **87**: 388-392.

Material examined: 1 ex., WGRC/V/A/639, Chorla, Belgaum; 1 ex., WGRC/V/A/696, Chorla, Belgaum, 04.viii.2009.

Diagnosis: A large sized caecilian, body shape is sub-cylindrical and slightly dorso-ventrally compressed; mostly of uniform width but slightly narrower anteriorly, posteriorly, the body tapers strongly towards the terminus; in lateral view, the top of the head is straight and the margin of the upper lip slightly arched. The snout projects beyond the mouth; nostrils are visible dorsally and laterally but not ventrally and are closer to the level of the snout tip than to the anterior most margin of the mouth; slightly raised tentacular apertures are visible in both dorsal and ventral views, they are close to the margin of the upper lip than to the top of the head; eyes are scarcely visible under the bones in life, eyes occur at the posterior end of a light pink colored stripe, the latter extends from behind the eye to immediately anterior to the tentacle; dentition 20 premaxillary-maxillary, 18 vomeropalatine, 10 dentary and 5 splenial teeth; nuchal region is broader and higher than the adjacent parts of the body; two nuchal collars that are marked clearly by three white-colored nuchal grooves; there are 114 complete primary annuli, secondary annular grooves appear on the 30th primary annulus; vent is surrounded by five anterior and six posterior denticles; ten secondary annular grooves in front of the vent are complete; rounded terminus ends in a small cap.

Distribution : Known from type locality (Bondla Wildlife Sanctuary, Goa) and surroundings (Bhatta, *et. al.,* 2007); and is found commonly in the bordering places of Maharashtra, Goa and Karnataka states (in press).

Elsewhere : Not known.

Note : Endemic to Western Ghats.

Family ICHTHYOPHIIDAE Taylor

Genus ***Ichthyophis*** Fitzinger

85. ***Ichthyophis beddomei*** Peters 1879

Beddome's Caecilian

1880. *Ichthyophis Beddomei* Peters, "1879", *Monatsber. Preuss. Akad. Wiss. Berlin,* 1879: 932.

Material examined: 1 ex., WGRC/V/A/683, Sringeri, Chickmagalur, 2000 August; 1 ex., WGRC/V/A/603, Keraekattae, Chickmagalur, 18.x.2005.

Diagnosis: Dark brown above; a creamy or canary yellow stripe extends from the tip of tail to the snout, which bifurcates at the angle of the mouth. Ventral surface somewhat lighter than the dorsum. Each annulus is darker on its anterior half, lighter posteriorly so that ventral surface and to a lesser extent the dorsum, shows as many rings as there are annuli. A cream spot present at the vent. Teeth in four series. The outer maxillaries are as large or larger than the largest dentaries. Tongue rather narrow anteriorly and does not cover the splenials. Choanae lateral, somewhat elongate and slightly angular. Tail very short and terminates to a point.

Distribution : Karnataka, Kerala and Tamil Nadu (Pillai and Ravichandran, 2005).

Elsewhere : Not known.

Note : Endemic to Western Ghats.

86. ***Ichthyophis bombayensis*** Taylor, 1960

Bombay Caecilian

1960. *Ichthyophis bombayensis* Taylor, *Univ. Kansas Sci. Bull.*, **40**: 67.

1960. *Ichthyophis malabarensis* Taylor, *Univ. Kansas Sci. Bull.*, **40**: 80.

1960. *Ichthyophis peninsularis* Taylor, *Univ. Kansas Sci. Bull.*, **40**: 61.

1960. *Ichthyophis subterrestris* Taylor, Univ. Kansas Sci. Bull., **40**: 65.

Material examined: 2 exs., WGRC/V/A/681, Sringeri, Chickmagalur, August, 2000.

Diagnosis: A large sized species of *Icthyophis*. Dorsally dark brown; posterior part of each annulus slightly lighter than the anterior region. Top of the head mottled with darker brown. Ventral surface lighter brown. Creamy spots present at the vent, eye, tentacle and nostril. Lips as well as the angle of mouth cream colored. Head long, depressed, roughly oval and narrower than the body. Eyes distinct, large, placed in a circular socket and surrounded by a whitish ring. Tentacular aperture, situated close to lip and closer to the eye than to nostril. Tail rather strongly compressed.

Distribution : Gujarat, Maharashtra, Karnataka, Kerala and Tamil Nadu (Pillai and Ravichandran, 2005).

Elsewhere : Not known.

Note : Endemic to Western Ghats, refer Gower *et al.*, 2007a for genetic homogeneity in un-striped *Ichthyophis* along Western Ghats.

87. ***Ichthyophis kodaguensis*** Wilkinson, Gower, Govindappa and Venkatachalaiah, 2007*

Kodagu Striped Ichthyophis

2007. *Ichthyophis kodaguensis husaini* Wilkinson, Gower, Govindappa and Venkatachalaiah, *Herpetologica*, **63**(4): 511-518.

Diagnosis: A large sized Ichthyophis, with narrow lateral yellow stripe extending from close to eye to level of vent, broken across collars, weakly indicated on lower jaw; body uniformly dark chestnut brown above, paler lilac-grey brown below. Known range in total length of metamorphosed animals 158-274 mm, about 20-25 times mid body width; 276-305 annuli; 25-31 inner mandibular (5 splenial), 33-44 dentary, 41-52 vomeropalatine and 38-49 premaxillary-maxillo-palatine teeth, increasing with total length, inner mandibular row shorter than dentary row, at least ten more dentary than inner mandibular teeth. Tentacle much less than twice as far from naris than from eye.

Distribution : Known from borders of Kerala and Karnataka.

Elsewhere : Not known.

Note : Endemic to Western Ghats.

Genus ***Uraeotyphlus*** Peters

88. ***Uraeotyphlus narayani*** Seshachar, 1939*

Narayan's Caecilian

1939. *Uraeotyphlus narayani* Seshachar, *Proc. Indian Acad. Sci., Ser. B*, **9**: 224228.

Diagnosis: A medium sized Uraeotyphlus growing up to 237 mm; total folds less than 190 (168-178); head relatively long, narrowing sharply and smoothly truncated in front; tentacular aperture almost ventral below and a little in front of nostril, much closer to nostril than to eye; body steel grey or brownish above, folds are marked by white lines; venter whitish with a median bluish green line.

Distribution : Karnataka and Kerala (Pillai and Ravichandran, 2005).

Elsewhere : Not known.

Note : Endemic to Western Ghats.

SUMMARY

Out of 299 species of amphibians known from India (Dinesh *et al.*, 2009), 88 species are known to occur in Karnataka. Among the 88 species recorded, type localities of 37 species belong to Karnataka and 28 species (Table 1) are endemic to the State.

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Table 1: Endemism in Amphibians of Karnataka

Family	Genus	Total no. of species in India	Status from Karnataka		
			No. of Species recorded	No of species described (type localities)	No of endemic species
Bufonidae	*Duttaphrynus*	13	7	1	nil
	Ghatophryne	2	1	1	nil
	Pedostibes	2	1	nil	nil
Dicroglossidae	*Euphlyctis*	5	4	2	2
	Fejervarya	19	8	6	6
	Hoplobatrachus	2	2	nil	nil
	Minervarya	2	1	nil	nil
	Sphaerotheca	4	3	2	1
Micrixalidae	*Micrixalus*	11	7	4	4
Microhylidae	*Kaloula*	4	1	nil	nil
	Microhyla	8	3	1	nil
	Ramanella	6	5	2	2
	Uperodon	2	2	nil	Nil
Nyctibatrachidae	*Nyctibatrachus*	16	9	6	4
Ranidae	*Clinotarsus*	2	1	nil	nil
	Hylarana	11	3	nil	nil
Ranixalidae	*Indirana*	10	6	3	3
Rhacophoridae	*Polypedates*	7	3	nil	nil
	Pseudophilautus	10	1	nil	nil
	Raorchestes	47	8	5	3
	Rhacophorus	13	2	nil	nil
Caeciliidae	*Gegeneophis*	10	6	3	2
Ichthyophiidae	*Ichthyophis*	8	3	1	1
	Uraeotyphlus	7	1	nil	nil
	Total	**—-**	**88**	**37**	**28**

Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 435-465, 2013

REPTILES

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INTRODUCTION

Karnataka state encompasses part of the Western Ghats, which is home for rich faunal diversity. The reptile fauna of Karnataka state comprises 126 of 506 species, i.e, 25% of Indian reptile fauna most of them are unique including rare, endemic and Gondwanaland lineages. Several specialists including Smith (1931, 1935, 1943), Murthy (1985, 1990, 1990a), Daniels (2000), Rajeev (2002), Das (2003) Sharma (2003), Whitaker and Captain (2004), Sharma (2007), Ganesh *et al.* (2007), Kannan and Rajagobalan (2008), Ganesh and Gowri Shankar (2009) have greatly enhanced the knowledge of reptile fauna of Karnataka.

Subsequent taxonomic revisions of Indian reptiles necessitated to updating the reptile fauna of this region. The present work attempts to fulfill these lacunae based on the faunal surveys undertaken by the Southern Regional Centre, Chennai and Western Regional Centre, Zoological Survey of India, Pune as well as additional information gathered from published literatures.

Key to the abbreviation : [ex.-example; exs.-examples; Coll–Collector / Collected by.]

SYSTEMATIC LIST

Phylum CHORDATA

Class REPTILIA

Order LORICATA

Family 1. CROCODYLIDAE

Genus ***Crocodylus*** Gronovius, 1763

1. *Crocodylus palustris* Lesson, 1834

Order CHELONIA

Suborder CRYPTODIRA

Family 2. DERMOCHELIDAE

Genus ***Dermochelys*** Blainville, 1816

2. *Dermochelys coriacea* Vandellius, 1761

Family 3. CHELONIDAE

Genus ***Lepidochelys*** Fitzinger, 1843

3. *Lepidochelys olivacea* (Eschscholtz,1829)

Family 4. GEOEMYDIDAE

Genus ***Vijayachelys*** Praschag *et al.*, 2006

4. *Vijayachelys silvatica* (Henderson, 1912)*

Genus ***Melanochelys*** Gray, 1869

5. *Melanochelys trijuga trijuga* (Schwaigger, 1812)

6. *Melanochelys trijuga coronata* (Anderson, 1879)

Family 5. TESTUDINIDAE

Genus ***Geochelone*** Fitzinger, 1835

7. *Geochelone elegans* (Schoepff, 1792)

Genus ***Indotestudo*** Lindholm, 1929

8. *Indotestudo travancoricus* (Boulenger, 1907)*

Family 6. TRIONYCHIDAE

Genus ***Aspideretes*** Hay,1904

9. *Aspideretes leithii* (Gray, 1872)*

Genus ***Lissemys*** Smith, 1931

10. *Lissemys punctata* (Bonnaterre, 1789)

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Order SQUAMATA

Suborder SAURIA

Family 7. GEKKONIDAE

Genus ***Geckoella*** Kulge,1993

11. *Geckoella dekkanensis* (Gunther, 1864)*
12. *Geckoella collegalensis* (Beddome, 1870)
13. *Geckoella albofasciatus* (Beddome, 1870)*

Genus ***Cnemaspis*** Strauch, 1887

14. *Cnemaspis indica* (Gray, 1846)*
15. *Cnemaspis heteropholis* Bauer, 2002*
16. *Cnemaspis indraneildasii* Bauer, 2002*
17. *Cnemaspis gracilis* (Beddome, 1870)*
18. *Cnemaspis mysoriensis* (Jerdon, 1853)*

Genus ***Hemidactylus*** Oken, 1817

19. *Hemidactylus brooki* Gray, 1845.
20. *Hemidactylus frenatus* Schlegel in : Dum. & Bibr., 1836
21. *Hemidactylus giganteus* Stoliczka, 1871*
22. *Hemidactylus leschenaultii* Dum. & Bibr., 1836
23. *Hemidactylus maculatus* Dum. & Bibr., 1836
24. *Hemidactylus prashadi* Smith, 1935*
25. *Hemidactylus reticulatus* Beddome, 1870*
26. *Hemidactylus triedrus* (Daudin, 1802)
27. *Hemidactylus flaviviridis* Ruppel,1835

Genus ***Hemiphyllodactylus*** Bleeker,1860

28. *Hemiphyllodactylus aurantiacus* (Beddome, 1870)*

Family 8. AGAMIDAE

Genus ***Calotes*** Rafinesque, 1815

29. *Calotes versicolor* (Daudin, 1802)
30. *Calotes calotes* (Linnaeus, 1758)
31. *Calotes rouxi* Dum. & Bibr.,1837*
32. *Calotes ellioti* Gunther, 1864*
33. *Calotes nemoricola* Jerdon, 1853*
34. *Calotes grandisquamis* Gunther, 1875*

Genus ***Draco*** Linnaeus, 1758

35. *Draco dussumieri* Dum. & Bibr., 1837*

Genus ***Psammophilus*** Fitzinger, 1843

36. *Psammophilus dorsalis* (Gray in : Griffith & Pidgeon, 1831)*
37. *Psammophilus blanfordanus* (Stoliczka, 1871)*

Genus ***Sitana*** Cuvier, 1829

38. *Sitana ponticeriana* Cuvier, 1829

Family 9. CHAMAELEONIDAE

Genus ***Chamaeleo*** Gronovius, 1763

39. *Chameleo zeylanicus* Laurenti, 1768

Family 10. SCINCIDAE

Genus *Eutropis* Fitzinger, 1843

40. *Eutropis carinata* (Schneider, 1801)
41. *Eutropis beddomii* (Jerdon, 1870)
42. *Eutropis macularius* (Blyth, 1853)
43. *Eutropis trivittata* (Hardwicke & Gray, 1827)*
44. *Eutropis allapallensis* (Schmidt, 1926)*

Genus *Lygosoma* Gray, 1828

45. *Lygosoma punctata* (Linnaeus, 1766)
46. *Lygosoma albopunctata* (Gray, 1846)
47. *Lygosoma guentheri* (Peters, 1879)*
48. *Lygosoma lineata* (Gray, 1836)*

Genus ***Kaestlea*** Eremchenko & Das, 2004

49. *Kaestlea beddomii* (Boulenger, 1887)*

Genus ***Ristella*** Gray, 1839

50. *Ristella beddomii* Boulenger, 1887*

Family 11. LACERTIDAE

Genus ***Ophisops*** Menetries, 1832

51. *Ophisops beddomei* (Jerdon, 1870)*
52. *Ophisops jerdoni* (Beddome, 1870)
53. *Ophisops leschenaultii* (Milne-Edwards, 1829)

Family 12. VARANIDAE

Genus ***Varanus*** Merrem, 1820

54. *Varanus bengalensis* (Daudin, 1802)

Suborder SERPENTES

Family 13. TYPHLOPIDAE

Genus ***Rhamphotyphlops*** Fitzinger, 1843

55. *Rhamphotyphlops braminus* (Daudin, 1803)

Genus ***Typhlops*** Oppel, 1811

56. *Typholops beddomei* Boulenger, 1890*
57. *Typhlops porrectus* Stoliczka, 1871

Genus ***Grypotyphlops*** Peters, 1881

58. *Grypotyphlops acutus* (Dum. & Bibr., 1844)*

Family 14. UROPELTIDAE

Genus ***Plecturus*** Dumeril, 1851

59. *Plectrurus canaricus* (Beddome, 1870)*
60. *Plectrurus perroteti* Dum. & Bibr., 1854*

Genus ***Uropeltis*** Cuvier, 1829

61. *Uropeltis ellioti* (Gray, 1845)*
62. *Uropeltis ceylanicus* Cuvier, 1829*
63. *Uropeltis ocellatus* (Beddome, 1863)*
64. *Uropeltis phipsoni* (Mason, 1888)*

Genus ***Melanophidium*** Gunther, 1864

65. *Melanophidium wynaudense* (Beddome, 1863)*
66. *Melanophidium punctatum* Beddome, 1871*

Genus ***Rhinophis*** Hemprich, 1820

67. *Rhinophis sanguineus* (Beddome, 1863)*

Family 15. BOIDAE

Genus ***Gongylophis*** Wagler, 1830

68. *Gongylophis conicus* (Schneider, 1801)

Genus ***Eryx*** Daudin, 1803

69. *Eryx johnii* (Russell, 1801)
70. *Eryx whitakeri* Das, 1991*

Genus ***Python*** Daudin, 1803

71. *Python molurus* (Linnaeus, 1758)

Family 16. ACROCHORDIDAE

Genus ***Acrochordus*** Hornstedt, 1787

72. *Acrochordus granulatus* (Schneider, 1799)

Family 17. COLUBRIDAE

Genus ***Ahaetulla*** Link, 1807

73. *Ahaetulla nasutus* (Lacepede, 1789)
74. *Ahaetulla pulverulentus* (Dum.& Bibr., 1854)

Genus ***Amphiesma*** Dum. & Bibr., 1854

75. *Amphiesma beddomei* (Gunther, 1864)*
76. *Amphiesma monticola* (Jerdon, 1853)*
77. *Amphiesma stolata* (Linnaeus, 1758)

Genus ***Argyrogena*** Werner, 1924

78. *Argyrogena fasciolatus* (Shaw, 1802)

Genus ***Atretium*** Cope, 1861

79. *Atretium schistosum* (Daudin, 1803)

Genus ***Rhabdops*** Boulenger, 1893

80. *Rhabdops olivaceus* (Beddome, 1863)*

Genus ***Boiga*** Fitzinger, 1826

81. *Boiga trigonata* (Schneider, 1802)
82. *Boiga forsteni* (Dum. & Bibr., 1854)
83. *Boiga ceylonensis* (Gunther, 1858)
84. *Boiga beddomei* (Wall, 1909)
85. *Boiga nuchalis* (Gunther, 1875)

Genus ***Cerberus*** Cuvier, 1829

86. *Cerbrus rhynchops* Schneider, 1799

Genus ***Gerardia*** Gray, 1849

87. *Gerardia prevostiana* (Eydoux & Gervais, 1832-1837)

Genus ***Dendrelaphis*** Boulenger, 1890

88. *Dendrelaphis tristis* (Daudin, 1803)
89. *Dendrelaphis pictus* (Gmelin, 1789) sensu Whitaker & Captain, 2004
90. *Dendrelaphis grandoculis* (Boulenger, 1890)*

Genus ***Chrysopelea*** Boie, 1826

91. *Chrysopelea ornata* (Shaw, 1802)

Genus ***Coelognathus*** Fitzinger, 1843

92. *Coelognathus helena* (Daudin, 1803)
93. *Coelognathus helena monticollaris* Schulz, 1992*

Genus ***Liopetis*** Fitzinger, 1843

94. *Liopetis calamaria* (Gunther, 1858)

Genus ***Lycodon*** Boie, 1826

95. *Lycodon aulicus* (Linnaeus, 1754)
96. *Lycodon striatus* (Shaw, 1802)
97. *Lycodon travancoricus* (Beddome, 1870)*

Genus ***Macropisthodon*** Boulenger, 1893

98. *Macropisthodon plumbicolor* (Cantor, 1839)

Genus ***Oligodon*** Boie, 1827

99. *Oligodon arnensis* (Shaw, 1802)
100. *Oligodon affinis* (Gunther, 1862)*
111. *Oligodon brevicaudus* (Gunthe,r 1862)*
102. *Oligodon taeniolatus* (Jerdon, 1853)

103. *Oligodon venustus* (Jerdon, 1853)*

Genus ***Ptyas*** Fitzinger, 1843

104. *Ptyas mucosus* (Linnaeus, 1758)

Genus ***Sibnyophis*** Fitzinger, 1843

105. *Sibnyophis subpunctatus* (Dum. & Bibr., 1854)

Genus ***Xenochrophis*** Gunther, 1864

106. *Xenochrophis piscator* (Schneider, 1799)

Family 18. ELAPIDAE

Genus ***Calliophis*** Gray, 1834

107. *Calliophis melanurus* (Shaw, 1802)

108. *Calliophis beddomei* Smith, 1943*

109. *Calliophis nigrescens* Gunther, 1862*

110. *Calliophis bibroni* (Jan, 1858)*

Genus ***Bungarus*** Daudin, 1803

111. *Bungarus caeruleus* (Schneider, 1801)

Genus ***Naja*** Laurenti, 1768

112. *Naja naja* (Linnaeus, 1758)

Genus ***Ophiophagus*** Gunther, 1864

113. *Ophiophagus hannah* (Cantor, 1836)

Family 19. HYDROPHIIDAE

Genus ***Kerilia*** Gray, 1849

114. *Kerilia jerdoni* Gray, 1849

Genus ***Enhydrina*** Boulenger, 1890

115. *Enhydrina schistosus* (Daudin, 1803)

Genus ***Hydrophis*** Latreille, 1802

116. *Hydrophis cyanocinctus* Daudin, 1803

117. *Hydrophis spiralis* Shaw, 1802

118. *Hydrophis ornatus ornatus* (Gray, 1842)

119. *Hydrophis caerulescens* (Shaw, 1802)

Genus ***Lapemis*** Gray, 1835

120. *Lapemis curtus* (Shaw, 1802)

Genus ***Pelamis*** Daudin, 1803

121. *Pelamis platurus* (Linnaeus ,1766)

Family 20. VIPERIDAE

Genus ***Dabioa*** Gray, 1842

122. *Dabioa russelii* (Shaw & Nodder, 1797)

Genus ***Echis*** Merrem, 1820

123. *Echis carinatus* (Schneider, 1801)

Genus ***Hypnale*** Fitzinger,1843

124. *Hypnale hypnale* (Merrem, 1802)

Genus ***Triemeresurus*** Lacepede, 1804

125. *Trimeresurus malabaricus* (Jerdon, 1854)*

126. *Trimeresurus gramineus* (Shaw, 1802)*

[* Endemic species and their status were given in the Remarks]

SYSTEMATIC ACCOUNT

Family 1. CROCODYLIDAE

1. ***Crocodylus palustris*** Lesson
Marsh crocodile

1834. *Crocodylus palustris Lesson, in Belang. Voy. Ind. Or., Zool. p. 305.*

Diagnosis : Snout in adult is $1^1/_3$ to 1½ times as long as broad at the base, usually without ridges in front of the eye, if it is present they extends only for a short distance. Body strongly armoured and four large nuchals forming a square with a smaller one on each side of the nape. Dorsal scute is about 17 transverse rows and 6 longitudinal series. The adults are olive brownish above and whitish below with prominent dark spots.

Distribution : Throughout the peninsular India.

Elsewhere : Bangladesh, Iran, Nepal, Pakistan and Sri Lanka.

Family 2. DERMOCHELIDAE

2. ***Dermochelys coriacea*** (Vandellius)
Leatherback sea tuttle

1761. *Testudo coriacea* Vandelli, Epistola de Holoturio et *Testudine coriacea* ad Caleberrimum Carolum Linnaeum, Padua:2 (Maris Tyrrheni Oram in agro Laurentiano)

1931. *Dermochelys coriacea Smith, Fauna Brit. Ind.,* **1** : 59.

Diagnosis : Head skin clad. Upper jaw bicuspid. Absence of scutes on the carapace which is covered with smooth leathery skin. 7 longitudinal ridges on carapace. 5 on plastron. Clawless flippers. This is the largest living turtle, attaining a length of 75 in (1905 mm). Colour dark brown to black above, spotted with white, paler below.

Distribution : Tamil Nadu, Kerala, Andhra Pradesh, Goa, Gujarat, Lakshadweep, Andaman and Nicobar Islands.

Elsewhere : Africa, America, Asia, Australia and Europe.

Family 3. CHELONIDAE

3. ***Lepidochelys olivacea*** (Eschscholtz)
Olive Ridley sea turtle

1829. *Chelonia olivacea* Eschscholtz, *Zool. Atlas*,p. 3,pl.3 (type loc. Manila Bay).

1998. *Lepidochelys olivacea, Fauna of India-Reptilia (Testudines & Crocodilia) Vol. I. p. 57.*

Diagnosis : A large head with upper jaws hooked. Usually more than 5 pairs of pleurals. Prominent pores on the sides of the plastron. First pleural touches the nuchal. 4 prefrontal shields on head. One claw on each flipper. Presence of 3 distinct keels on carapace of young. Length 27.5 in. Olive green above and pale yellow below.

Distribution : Andhra Pradesh, Kerala, Goa, Gujarat, Maharashtra, Orissa, West Bengal and Lakshadweep and Andaman and Nicobar islands.

Elsewhere : Africa, America, Asia and Australia.

Family 4. GEOEMYDIDAE

4. ***Vijayachelys silvatica*** (Henderson)
Cochin forest cane turtle

1912. *Geomyda sylvatica* Henderson, *Rec. Ind. Mus.* **7** : 217 (type. loc. near Kavalai, Cochin State Forest S. India; Ind. Mus.)

2009. *Vijayachelys silvatica* Nikhil Whitaker and J. Vijaya *Chelonian Conservation and Biology*, **8**(2) : 109-115.

Diagnosis : Very small, seretive fresh water turtle not reaching 12 cm.in length. Head is comparatively large, snout tube like truncated anteriorly and is as long as orbit, upper jaw hokked. Carapace is darkbrown or bronzy. Plastron is yellow with two distinct deep yellow spots on the bridge. Upper portion of the forehead and jaws are bright yellow, hinder part of head and neck are brown, limbs and tail are black.Top of snout is provided with red spot.

Distribution : India : Kerala

Remarks : Endemic to Western Ghats.

5. ***Melanochelys trijuga trijuga*** Schweigger
Indian snail-eating turtle

1814. *Emys trijuga* Schweigger, *Prodr. Monog. Chel.* P. 41 (type loc. Java.)

1998. *Melanochelys trijuga trijuga* Sharma, *Fauna of India, Reptilia (Testudines & Crocodilia) Vol. I. p. 82.*

Meterial examined : 1ex., Nagerhole river Puchekal Nagerhole. N. B. R. 21. xii. 89 S.V. Muley, Coll.

Diagnosis : Carapace moderately depressed and with three keels. Enlarged scales on the front part of forelimb and the hind part of hind limb. Digits well webbed. Length 9 in. Light brown in the young, dark brown to almost black in the adult. Head grey or olive, with yellow or pink reticulation, especially on the sides. Undersurface, dark with a yellow margin, more prominent in the young.

Distribution : India : Tamil Nadu, Andhra Pradesh, Kerala , Karnataka, Maharashtra, Goa excluding the west coast.

6. ***Melanochelys trijuga coranata*** (Anderson)
Cochin black turtle

1879. *Emys trijuga Var. coronata*, Anderson, *Zool. Res.* w. Yunnan, 729 (type loc. Travancore).

1998. *Melanochelys trijuga coranata* Sharma, *Fauna of India-Reptilia (Testudines & Crocodilia)* Vol. I. p. 85.

Diagnosis : Small turtle in which the length never exceeds 18 cm. Dorsum and ventrum is dark brown or almost black without markings or spots. Top of the head and front of the snout black, temporal region is yellow and the rest of the head is olivaceous.

Distribution : India : Kerala (Cochin, Calicut) and the West coast and associated hills of Peninsular India).

Family 5. TESTUDINIDAE

7. ***Geochelone elegans*** (Schoepff)
Indian star tortoise

1792. *Testudo* elegans Schoepff, *Hist. Test.* p.iii. pl. xxv (type loc. india.)

1998. *Geochelone elegans* Sharma, *Fauna of India-Reptilia (Testudines &Crocodilia) Vol. I. p. 111.*

Diagnosis : Carapace is elongated, highly domed, the vertebral and costal shields form well marked conical humps in the adults, the apex of each hump correspond with the areola; lateral aspects of carapace are almost vertical; anterior and posterior margins reverted, the posterior one is strongly serrated. Nuchal shield is not present. Head and limbs are yellow more or less spotted with dark brown or black.

Distribution : India : Peninsular India.

Elsewhere : Pakistan and Sri Lanka.

8. ***Indotestudo travancoricus*** (Boulenger)
Travancore tortoise

1907. *Testudo travancorica,* Boulenger, *J. Bom. nat. Hist. Soc.,* **17** : 560, 2 pls (type loc.Travancore Hills Brit. Mus.)

2003. *Indotestudo travancoricus*, Das, *J. Bombay Nat. Hist. Soc.*, **100** (2 &3) Aug-Dec. p. 458.

Diagnosis : Carapace, depressed. Upper jaw slightly hooked. Nuchal absent and carapace less elongate than in the elongated tortoise. Tail ends in a claw-like tubercle.Yellow or olive with black blotches above and below. During the breeding season, the area around the nostrils and eyes become reddish in colour.

Distribution : Karnataka and Kerala.

Remarks : Endemic to Western Ghats.

Family 6. TRIONYCHIDAE

9. **Aspideretes leithi** *Gray*
Leith's softshell turtle

1872. *Trionyx leithi* Gray, *Ann. Mag. Nat. Hist.* (4) x, p. 334 (type loc. Poona : Brit. Mus.)

2003. *Aspideretes leithi,* Das, *J. Bombay Nat. Hist. Soc.*, 100 (2&3) Aug-Dec. p. 459.

Diagnosis : Carapace low and oval; a large head, with a snout longer than in the Indian soft-shell turtle. Length 20 in. Colour of young, Olive or greenish above with 4-6 eye-like markings, which disappear with age. Head greenish, with the forehead mottled with orange and yellow, often with broken black streaks between eye and nape.

Distribution :Andhra Pradesh, Karnataka, Kerala, Maharashtra and Tamil Nadu.

Remarks : Endemic to Peninsular India.

10. ***Lissemys punctata*** (Bonnaterre)
Indian flapshell turtle

1788. *La Tortue changrinee* Lacepede, *Hist. Quad. Ovip.* i.p 171, pl. xi.

1997. *Lissemys punctata*, Bonnaterre, Das, *Hamadryad Vol.* 22. p. 33.

Meterial examined : 1 ex., Athikupa halli, 17.ix.2003, G. Thirumalai, Coll.

Diagnosis : The presence of skin flaps on the plastron for hiding the hind limbs and the tail. Carapace more or less oval and covered with smooth skin which have plaited appearance in the young. The front and the back margins of the shell can be bend down to completely hide the retracted head and limbs. Digits fully webbed and the tail is short. Plastron with seven callosities.

Distribution : Indian sub continent.

Elsewhere : Sri Lanka.

Family 7. GEKKONIDAE

11. ***Geckoella dekkanensis*** (Gunther)
Deccan rock gecko

1864. *Gymnodactylus dekkanensis* Gunther, *Rept. Brit. Ind.* p. 115.

2003. *Geckoella dekkanensis*, Das, *J. Bombay Nat. Hist. Soc.,* **100** (2&3) Aug-Dec. p. 459.

Material examined : 1ex., Mathesurae kare, 14. ix. 2003, G. Thirumalai, Coll.; 1ex., Ebola, Antharagangavallae, 14. ix. 2003, Thirumalai, Coll.

Diagnosis : Head covered with moderately small rounded scales, which become larger and conical in shape upon the nape. Reddish brown above with white, brown edged transverse bars upon the back and tail. A curved mark upon the nape extending to the eyes. Ventral side of the body is whitish.

Distribution : INDIA : Western Ghats part of Karnataka and Maharashtra.

Remarks : Endemic to North Western Ghats.

12. ***Geckoella collegalensis*** (Beddome)
Collegal rock-gecko

1870. *Gymnodactylus collegalensis* Beddome, *Madras Month. J. Med. Sc.* ii. P. 173.

2003. *Geckoella collegalensis*, Das, *J. Bombay nat. Hist. Soc.*, **100** (2&3) Aug-Dec. p. 459.

Diagnosis : A conspicuously and handsomely colored gecko. Light brown or grayish above, with large rounded or oval black edged paired spots upon the back and tail and much smaller spots irregularly arranged. Dorsal pholidosis composed of small granular scales intermixed with larger keeled scales.

Distribution : INDIA: Hills of southern India.

Elsewhere : Sri Lanka.

13. ***Geckoella albofasciatus*** Boulenger
White barred rock gecko

1885. *Gymnodactylus albofasciatus* Boulenger, *Cat. Liz. Brit. Mus.* **I** : p. 37, pl. 4, fig. 3 (type loc. S. Kanera).

2003. *Geckoella albofasciatus*, Das, *J. Bombay nat. Hist. Soc.*, **100** (2&3) Aug-Dec. p. 459.

Diagnosis : Moderately large gecko with brilliant colouration, with alternate black and yellow transverse bars all over the dorsum; a curved black streak emerges from the nape and reaches up to eyes, belly is white. Males are devoid of preanal or femoral pores.

Distribution : INDIA : Karnataka (Karwar, South Kannara and Castle Rock), Goa (Mollem).

Remarks : Endemic to India.

14. ***Cnemaspis indica*** (Gray)
Nilgiri dwarf gecko

1846. *Goniodactylus indicus* Gray, *Ann. Mag. Nat. His.*, **18** : 429.

1985. *Cnemaspis indica* Murthy, *Rec. zool. Surv. India, Occ. Pap.*, **72** : 19.

Material examined : 1ex., Thammanayakanahalli, 10. xii. 2005, S. Prabakaran, coll.

Diagnosis : Body is greenish brown with a row of orange yellowish spots traversed from the head to tail and also a similar spots traversing in the lateral side of the body. A light vertebral line is present.

Distribution : I ndia : Tamil Nadu : Nilgiris, Karnataka : Coorg.

Remarks : Endemic to Western Ghats.

15. ***Cnemaspis heteropholis*** Bauer

2002. *Cnemaspis heteropholis* Bauer, *Mitt. hamb. Zool. Mus. Inst.*, **99** : 155-167.

Diagnosis : Dorsum a mottled light brown; flanks darker with faint, darkspots. Dorsum of head and vertebral region pale with a longitutional series of irregular spots.Tubercles whitish, contrasting with base colour, especially on fanks. Limbs mottled, digits with alternating light and dark bands.Tail mid brown alternating with cream bands and white at joints.

Distribution : Uttara Kannada

Remarks : Endemic to Western Ghats

16. ***Cnemasps indraneildasii*** Bauer

2002. *Cnemasps indraneildasii* Bauer, *Mitt. hamb. Zool. Mus. Inst.*, **99** : 155-167.

Diagnosis : Colouration (in preservative). Ground colour of dorsum light brown with an amorphous buff vertebral stripe, Dorsal and especially lateral surfaces mottled with darker brown. A dark brown nuchal spot and weakly defined nuchal ring present. Vague dark reticulations on the top of head. A series of irregular paired dark dorsolateral markings along back, nearly meeting to form three cross bands between axilla and groin. Tail weakly banded.

Distribution : Uttara Kannada.

Remarks : Endemic to Western Ghats.

17. ***Cnemaspis gracilis*** (Beddome)
Indian forest gecko

1870. *Gymnodactylus gracilis* Beddome, *Madras Month. J. Med. Sci.* i, p. 32. (type loc. Palaghat hills, Madras presidency)

1935. *Cnemaspis gracilis*, Smith, *Fauna of British India*, **2** : p. 74.

Material examined : 2 exs., Mudan Kero,

Medikare, 111. xii. 07, R. Aengals, Coll.; 3 exs., Pojakal nullah, Nagarhole, 9. xii. 07. R. Aengals, Coll.; 5 exs., Minehole, Nalur, Thirthahalli, 20. xii. 07. R. Aengals, Coll.; 6 exs., Mashihole, 16.xii.07. R. Aengals, Coll.

Diagnosis : Grey brown above with lighter and darker spots. Nape often with two or three jet block vertebral spots and usually a series of light vertebral spots down the back. Tail with dark bands.

Distribution : India : Hills of South-West India.

18. ***Cnemaspis mysoriensis*** (Jerdon)
Mysore dwarf gecko

1853. *Gymnodactylus mysoriensis* Jerdon, *J. Asiatic. Soc. Beng*. **22**: p.469 (type loc. Bangalore; type lost).

1935. *Cnemaspis mysoriensis, Smith, Fauna. Brit. Ind: p.*72.

Material examined : 1ex., Hanuman temple Malur Kolar, 5. iii. 78, M.B. Rao, Coll. 1ex., Kulai tank, Chintamani Kolar, 13. iii. 78, M.B. Rao, Coll. 1ex., Nandi hill Kolar, 21. iii. 78 M.B. Rao, Coll. 2 exs., Woodhouse, Bangalore, 8. xii. 07, R. Aengals, Coll. 1 ex., Lakshmana theartham, Kallahalla range, 10. xii. 07, R. Aengals, Coll. 1 ex., Peacock Kere, Kallahalla range, 9. xii. 07. R. Aengals, Coll.

Diagnosis : Brown above and brownish white below. Back with a midstripe and prominent dark brown spots. Throat suffused with brown. Digits with dark bars. Tail much longer than the head and body.

Distribution : India: Karnataka, Kerala and Tamilnadu.

Remarks : Endemic to Western Ghats.

19. ***Hemidactylus brooki*** Gray
Spotted Indian house gecko

1845. *Hemidactylus brooki* Gray, *Cat, Liz Brit., Mus. p.* 153.

1935. *Hemidactylus brooki,* Smith, *Fauna of British India,* **2** : *p. 89.*

Material examined : 1ex., Chickmangalur, Mysore, 22. i. 64. B.K. Tikader, Coll.; 3exs., Cashew nut Research centre, Ullal, Mangalore. 3. i. 76. G.M. Yazdani, Coll.; 1ex., Kali River Ganeshgudi Supa dam North Kannara, 15. ix. 91, R.M.Sharma, Coll.1ex., Ebdla Antharagangvallae, 14. ix. 2003. G. Thirumalai, Coll. 4 exs., Kagglahalli, Harohalli range 11. xii. 2005 S.Prabakaran, Coll. 4 exs., Kagglahalli, Harohalli range 11. xii. 2005 S. Prabakaran, Coll. 1 ex., Nagerhole, 11. xii. 07. R. Aengals, Coll.; 1 ex., Thirthahalli, 20. xii. 07. R. Aengals, Coll.; 1 ex., Bonegar, Medikare, 11. xii. 07, R. Aengals, Coll.; 1 ex., Nagarhole, 9. xii. 07. R. Aengals, Coll.; 2 ex., Iyappan temple, 13. xii. 07. R. Aengals, Coll.; 4 exs., Sudar tank, Siringere range, 18. xii. 07. R. Aengals, Coll.

Diagnosis : It is found to be light grey above, with dark brown spots more or less regularly arranged somewhat like broken transverse bands on the back. The dark streak along the side of the head and dirty whitish below.

Distribution : The whole of India.

Elsewhere : Ceylon and known from Borneo and South China through most of tropical Asia and North Africa.

20. ***Hemidactylus frenatus*** Schlegel in. (Dum. & Bibr.)
Southern house gecko

1836. *Hemidactylus frenatus* Schlegel, *in Dum. & Bibr. Erp. Gen.* **3**,. 366

Material examined : 2 exs., Swarnamuki beat, 12. ix. 2003, G. Thirumalai, Coll. 2 exs., Thirthahalli, 20. xii. 07, R. Aengals, Coll.; 1.ex., Wood house Bangalore, 9. xii. 07, R. Aengals, Coll; 2 exs., Devarkatte, 10. xii. 07. R. Aengals, Coll.; 1 ex., Konaje village, 14. xii. 07. R. Aengals, Coll.; 1 ex., Sudartank, Siringer range 18. xii. 07. R. Aengals, Coll.

Diagnosis : Dark brownish dorsally with distinct darker marking often arranged as longitudinal stripes on the back and whitish below. Head marked with dark and light lines.Tail coral red.

Distribution : India : Peninsular India,West Bengal, Andaman and Nicobar Islands.

Elsewhere : Bangaladesh.

21. ***Hemidactylus giganteus*** Stoliczka
Giant tree gecko

1871. *Hemidactylus giganteus* Stoliczka, *P. Asiatic. Soc. Bengal* p.193.

1872. *Hemidactylus giganteus P. Asiatic. Soc. Bengal* 41 (2) : p 99. pl. 2., fig. 2 (type loc near Bhadrachalam, Godavary Valley)

Material examined : 1ex., Ramonguli Karwar, Mysore, 17. ii. 71. B.S. Lamba, Coll.

Diagnosis : Size large. Back with more or less uniform small granules; no enlarged tubercles; belly with smooth, rounded, imbricate scales; 13-15 lamellae under the fourth tee. Male with 40 preanal-femoral pores. Greyish dorsally and whitish on the undersides. Back with prominent and large W-shaped cross-bars.

Distribution : Southern India.

Remarks : Endemic to Eastern Ghats and Western Ghats.

22. ***Hemidactylus leschenaultii*** Dum. & Bibr.
Bark gecko

1836. *Hemidactylus leschenaulti* Dum.& Bibr., *Exp. Gen.* iii, p. 364

2003. *Hemidactylus leschenaultii* Das, *J. Bombay Nat. Hist. Soc.*, **100** (2&3) Aug-Dec. p. 447-501.

Diagnosis : Grey above and whitish below; dorsum with conspicuous wavy cross-bars; a dark streak from the eye extending on to the sides of the body.

Distribution : India : Throughout India.

Elsewhere : Sri Lanka.

23. ***Hemidactylus maculatus*** (Dum. & Bibr.)
Giant spotted gecko

1836. *Hemidactylus maculatus* Dum and Bibr, *Erp. Gen.* iii, p. 358 (type loc. India (Bombay): paris).

Diagnosis : Dorsally brown with darker spots, which unite sometimes to form undulating cross-bars and dirty whitish below; head with two dark stripes on each side.Young with five distinct dorsal cross-bars. Tail of the young and adult banded alternately.

Distribution : India : Tamil Nadu, Karnataka, Kerala and Maharashtra.

24. ***Hemitdactylus prashadi*** Smith
Prasad brown gecko

1935. *Hemitdactylus prashadi* Smith, *Fauna of British India,* **2** : p. 92.

Diagnosis : Body covered with small granular scales intermixed with much larger subtrihedral tubercles. Upper labials 11-12; lower labials 9-11. Fourth toe with ten subdigital lamellae. Male with 17-20 preano-femoral pores separated by three scales. Brownish grey above with three faint crossbars on the back.

Distribution : Jog, North Kannada District of Karnataka.

Remarks : Endemic to Western Ghats.

25. ***Hemidactylus reticulatus*** Beddome
Reticulate gecko

1870. *Hemidactylus reticulatus* Beddome, *Madras Month. J. Med. Sci.*, **1** : p. 33 (type loc. Kollegal, Karnataka).

Diagnosis : Back with erect; keeled granules and enlarged, pointed and keeled tubercles; lamellae on the fourth toe 8 to 10. Male with 6 to 12 preanal pores. Brown above with a characteristic pattern of darker lines arranged in a network on the back. Belly whitish and throat mottled with brown. Most of the dorsal tubercles whitish.

Distribution : Hills of Tamil Nadu, Karnataka and Andhra Pradesh.

Remarks : Endemic to Eastern Ghats and Western Ghats.

26. ***Hemidactylus triedrus*** (Daudin)
Termite hill gecko

1802. *Gecko triedrus* Daudin, *Hist. Nat. Rept.*, 4. p. 155

1935. *Hemidactylus triedrus*, Smith, *Fauna of British India*, 2 : p. 88.

Material examined : 1ex., Urugunthoddai, BNP, 19. iii. 2004, K. Remadevi, Coll.

Diagnosis : Head rather large and the snout obtusely pointed. Body heavily tuberculated and it can be easily recognized by three white edged olive green cross bars and pinkish white below. Tail marked with regular black and light rings.

Distribution : India : Tamil Nadu, Andhra Pradesh, Karnataka, Kerala and Maharashtra.

Elsewhere : Sri Lanka and West Pakistan.

27. ***Hemidactylus flaviviridis*** Rüppell, 1835
Yellow-bellied house gecko

1833. *Hemidactylus flaviviridis* Rüppell, *New wirb. Faun. Abyss* : p. 18, pl, 6, fig. 2 (type loc. Massauna Is. Eritrea).

Diagnosis : Large and robust gecko, olive brown by day with wavy cross-bars and pale grey by night without any trace of the markings. Ventral surfaces remain lemon yellowish always.

Distribution : India : Northern India Bombay and Pune, Maharastra, Gujarat and West Bengal.

Elsewhere : Coasts of Arabian and Iran.

28. ***Hemiphyllodactylus aurantiacus*** Beddome
Southern forest ground gecko

1870. *Hemidactylus aurantiacus* Beddome *Madras Month. J. Med. Sci.*, **1** : p.33 (type loc. Shevaroy Hills, South India).

2003. *Hemiphyllodactylus aurantiacus* Das, *J. Bombay nat. Hist. Soc.*, **100** (2&3) Aug-Dec. p. 447-501.

Diagnosis : Body covered above with numerous, minute granular scales and belly with rows of small, rounded scales; tail without spines.Brown above with black streaks on the neck and anterior region of the body and flecked with black on the middle of the back and posteriorly; whitish beneath, Tail orange in colour with black blotches.

Distribution : India : Tamil Nadu, Andhra Pradesh and Karnataka.

Family 8. AGAMIDAE

29. ***Calotes versicolor*** (Daudin)
Indian garden lizard

1802. *Agama versicolar* Daudin, *Hist. Nat. Rept.* 3 : 395, pl. 45

1935. *Calotes versicolor,* Smith, *Fauna of British India*, 2 : p.189.

Material examined : 1 ex., Medikere, Halakote village Mysore, 26. i. 64. B.K. Tikadar, Coll. 1 ex., Sagar, Shimoga Mysore 7. iii. 65, B.K. Tikadar, Coll. 1 ex., Sunkeri Karwar, 26. xii. 75. G.M. Yazdani, Coll. 2exs., Kilkotta, Kolar. 3. iii. 78 M.B. Rao, Coll. 1 ex., Fatli, Kolar. 4. iii. 78 M.B. Rao, Coll. 1ex., Mashid Basalaguntha pond, Mulbagal Dt., Kolar. 8. iii. 78 M.B. Rao, Coll.1 ex., Kulai tank, Chintamani, Kolar, 13. iii. 78 M.B. Rao, Coll. 2exs., Kanepalli tank, Chintamani Kolar 13. iii. 78 M.B. Rao, Coll. 1 ex., Anuyu, Chintamani Kolar, 15. iii. 78 M.B. Rao, Coll. 1 ex., Gourimbidanur Kolar, 20. iii. 78 M.B.Rao, Coll. 2 exs., Manchanahalli, Kolar. 20. iii. 78 M.B. Rao, Coll. 1 ex., Nandi Hills Kolar, 21. iii. 78 M.B.Rao, Coll. 2 exs., Srinivasa Sagar tank, Manchanhalli Kolar. 23. iii. 78 M.B. Rao, Coll. 1 ex., Sulkeri river, Kerkala, Belthangady road, South Kanara. 17. ii. 92. P.P. Kulkarni, Coll. 1ex., Athikupae halli, 17. ix. 2003 G. Thirumalai, Coll. 1ex., Malenallasndara, 10. xii, 2005, S. Prabakaran, coll. 2exs., Gabbadikere, 11. xii. 2005, S. Prabakaran, coll.

Diagnosis : Body compressed, dorsal scales strongly keeled and more or less larger than ventral; two well – separated spines on each side of the back of the head above the ear. Body is grayish brown above with dark transverse bars. Tail is marked with light and dark bands.

Distribution : India : Throughout India.

Elsewhere : Sumatra to South-China, Sri Lanka, Pakistan and Afghanistan.

30. ***Calotes calotes*** (Linnaeus)
Green calotes

1758. *Lacerta calotes* Linnaeus, *Syst. Nat. 10th ed.* : p. 207 (type loc. Sri Lanka).

1935. *Calotes calotes* Smith, *Fauna of British India,* **2** : p. 201.

Diagnosis : Bright green above with four or five bluish white or green cross-bars; head light yellowish to dark bluish green and throat red; ventrally pale greenish. Young brown above with six dark cross bands between two whitish dorso-lateral stripes.

Distribution : India : Shevaroy Hills, Malabar coast and Nicobar Islands.

Elsewhere : Sri Lanka.

31. ***Calotes rouxi*** Dum. & Bibr.
Forest blood sucker

1871. *Calotes rouxi* Dum & Bibr., *Exp. Gen.* **4** : p. 407. (type loc. India).

Diagnosis : Two small serrated spines on the back of the head; from 50 to 60 scales round the midbody; a long, oblique curved fold in front of the shoulder extending nearly across the throat. Dorsally olive-brown with a dark band along the side of the head.Ventral surfaces light brownish, upper part of the head, nape, and gular pouch brick red.

Distribution : India : Western coastal areas from Bombay to Kerala. (Matheran, Khandala, Kanara, Jog, Goa and Malabar).

Remarks : Endemic to Western Ghats.

32. ***Calotes ellioti*** Gunther
South Indian hill calotes

1864. *Calotes elliotti* Gunther, *Rept. Brit. Ind.*: p. 142 (type loc. Malabar).

2003. *Calotes ellioti* Das, *J. Bombay Nat. Hist. Soc* 100 (2 & 3) Aug-Dec. p. 447-501.

Diagnosis : Dorsum is olive-brown characterized by more or less distinct dark-brown angular cross-bars. A white spot below the eye is the essential characteristic of this species.

Distribution : India : Western Ghats and Malabar coast

Remarks : Endemic to Western Ghats.

33. ***Calotes nemoricola*** Jerdon
Nilgiri green calotes

1853. *Calotes nemoricola* Jerdon, *J.A.S, Bengal*, xxii, p. 471. (type loc. Coonoor Ghat, Nilgiri Hills Calcutta).

Diagnosis : Dorsal scales unusually large, about three time as wide as ventral's; midbody scale rows from vary from 36 to 43. A cluster of 3 or 4 compressed spines above the tympanum. Greenish above with darker markings. A black streak from the eye to above the tympanum, dirty whitish on the undersides.Throat with black streaks.

Distribution : India : Nilgris, Western Ghats.

Remarks : Endemic to Western Ghats.

34. ***Calotes grandisquamis*** Gunther
Large scaled green lizard

1875. *Calotes grandisquamis* Gunther, *Proc. Zool. Soc.* p. 266 pl. xxx (type loc. foot of Coonoor Ghat, near Manantoddy, Bramagherry Hills : London).

Diagnosis : Head a little longer, its breadth about one and three-quarter times its length. Dorsal and ventral scales larger. Green above and uniform with broad black transverse bars.An orange spot may be present in the centre of each black scale. Lower parts pale green.

Distribution : India : Anaimalai and Bramagherry Hills ; Ponmudi (Travancore).

Remarks : Endemic to Western Ghats.

35. ***Draco dussumieri*** Dum. & Bibr.
South Indian flying lizard

1837. *Draco dussumieri* Dum. & Bibr., *Erp.Gen.*4 :p 456. (type loc. Malabar).

1943. *Draco dussumieri* Smith, *Fauna of British India*, 2 : p. 143.

Diagnosis : Greish-brown dorsally with darker markings and a series of dark circles; petagia purplish black whitish with rounded yellowish spots. Colour pattern of the petagia, which may be different in the two sexes, is a valuable aid in identification. Undersides grayish with a series of large black marginal spots. Throat dary blue suffused with black spots.

Distribution : India : Tamil Nadu, Kerala, Karnataka, Maharashtra and Goa.

Remarks : Endemic to Western Ghats.

36. ***Psammophilus dorsalis*** (Gray)
South Indian rock lizard

1831. *Agama dorsalis* Gray, *in Griffith's Anim. King.* 9, *Syn.* : p. 56 (type loc. India).

1935. *Psammophilus dorsalis*, Smith, *Fauna of British India*, 2 : p. 209.

Material examined : 2 exs., Kilkotta, Kolar 3. iii. 78 M.B. Rao, Coll. 1 ex., Hanuman temple, Malur Kolar, 5. iii. 78 M. B.Rao, Coll. 1 ex., Basonatta village Kolar, 10. iii. 78 M. B. Rao,

Coll. 1 ex., Kulai tank, Chintamani Kolar, 13. iii. 78 M. B. Rao, Coll. 3 exs., Manchanapani tank Chikkaballyur, Kolar, 18. iii. 78 M. B. Rao, Coll.; 2 exs., Gudibunde tank, Kolar, 22. iii. 78 M. B.Rao, Coll. 1ex., Udugubandu, 11. ix. 2003, G. Thirumalai, Coll.; 2 exs., Uruganthottai, Thattekere 19. iii. 2004, K. Rema Devi, Coll. 1ex., Udugubandu 9. xii. 2005 S. Prabakaran, coll. 1ex., Malenallasndara, 10. xii. 2005, S. Prabakaran coll.

Diagnosis : Body depressed, dorsal crest is absent; ventral scales as large as the dorsals, male brownish on the top of the head and back,lips yellowish. Young and females or olive brown with a distinct serious of white elongated spots on the back, under side is yellow. Tail is long and slender.

Distribution : Hilly terrains of South India

Remarks : Endemic to Peninsular India.

37. ***Psammophilus blanfordanus***(Stoliczka)
Dwarf rock lizard

1870. *Charasia blanfordana* (not of Gray) Stoliczka, *P. Asiat. Soc. Beng*. P. 194. (type loc. Central India).

1935. *Psamnophilus blanfordanaus* : *Smith, Fauna of British India,* **2** : p. 210

Diagnosis : This species in smaller than the preceding species and differs in having slightly Enlarged dorsal scales on the body, male brownish on the top of the head and young are olive–brown above, spotted or marble with brown. It has usually a serious of large lozenge, shaped dark–brown spots on the back and the tail. The marking persist more or less in the female, but disappear in the male.

Distribution : India : Bihar, Orissa, Madhya Pradesh, Eastern Ghats and Western Ghats.

Remarks : Endemic to Eastern Ghats &Western Ghats and Deccan.

38. ***Sitana ponticeriana*** Cuvier
Fan throated lizard

1829. *Sitana ponticeriana* Cuvier, *Regne. Anim.* 2 nd ex. 2 : p 43 (type loc. Pondicherry; Paris).

Material examined : 2 exs., Avulakuppam Kolar, 14. iii. 78, M. B. Rao, Coll.; 1 ex., Illinga, South Kannara 3. viii. 91, S. S. Kamble, Coll.; 3 exs., Jog falls, North Kannara 26. ix. 91, R. M. Sharma, Coll.; 1ex., Swarnamuki beat,12. ix. 2003, G. Thirumalai, Coll. 1ex., Uruganthoddai, 19. iii. 2004, K. Rema Devi, Coll.

Diagnosis : Body compressed light brown above with series of dark brown, black-edged rhomboidal spots along the middle of the back. A distinct light line along each side of the spots and the ventral side is whitish ; Tail round and slender and covered with equal keeled scales.

Distribution : India : Whole of India.

Elsewhere : Sri Lanka.

Family 9. CHAMAELEONIDAE

39. ***Chamaeleo zeylanicus*** Laurenti
Indian Chamaeleon

1768. *Chamaeleo zeylanicus* Laurenti, *Syn. Rept.* p. 46 (based on Seba, i, pl. 82, fig. 3).

1935. *Chamaeleon zeylanicus* Smith, *Fauna of British India*, **2** : p. 251.

Diagnosis : Indian Chameleon is usually green in colour, varying in shade from pale yellowish to black but it is rarely yellow. The lower parts are yellowish to greenish white.Full grown individuals measures 380 mm in length including tail.

Distribution : South Gangetic plains and Southern India.

Elsewhere : Sri Lanka.

Family 10. SCINCIDAE

40. ***Eutropis carinata*** (Schneider)
Common keeled skink

1801. *Scincus carinatus* Schneider, *Hist. Amph.* **2** : 183.

2002. *Eutropis carinata* Mausfeld, *et al., Zoologischer Anzeiger*, **241** : 281-293.

Material examined : 2 exs., Kilkotta, Kolar, 3. iii. 78, M. B. Rao, Coll.; 1 ex., Fatli, Kolar, 4. iii. 78, M. B. Rao, Coll.; 1 ex., Anuya, Chintamani, Kolar 15. iii. 78, M. B. Rao, Coll.; 1ex., Gabbadikeri; Harohalli range, 11. xii. 2005, S. Prabakaran, coll.

Diagnosis : Dorsal and lateral scales subequal, head with enlarged scales arranged

symmentrically. Body robust covered with cycloid imbricate scales, lower eye-lid scaly. Dorsum bronzy, sides darker. Body characterised by two prominent dorso–lateral stripes, one starting from above the eye and extending to the tail and a second starting from the upper lip and extending to the groin. Underside yellow.

Distribution : India : Peninsular India, Assam and Bengal

Elsewhere : Sri Lanka and Nepal.

41. ***Eutropis beddomii*** (Jerdon)
Beddome's skink

1870. *Euprepes beddomii* Jerdon, *A.S, Beng.* P. 73 (type loc. Mysore).

2002. *Eutropis beddomii* Mausfeld, *et al. Zoologischer Anzeiger*, **241** : 281-293.

Diagnosis : Young brown above with 4 dark brown longitudinal stripes and whitish below. Adults have the same ground colouration but lack the prominent longitudinal stripes which if present are indicated as traces upon the neck and anterior region of the adult.

Distribution : India : Tamil Nadu, Kerala and Karnataka.

Elsewhere : Sri Lanka.

42. ***Eutropis macularius*** (Blyth)
Bronze grass skink

1853. *Euprepes macularius* Blyth, *J.A.S, Bengal*, **22** : p.652 (type loc. Rangpur, Bengal).

2002. *Eutropis macularius* Mausfeld, *et al., Zoologischer Anzeiger*, **241** : 281-293.

Diagnosis : Dark bronze above, with or without small black spots longitudinally arranged. A light dorso-lateral stripe more or less distinct. Sides of neck and flank dark brown, usually with white spots. A light line starting from the upper lip extends backward or to the anterior part of the flank. Tail not twice the length of the head and body.

Distribution : India : Peninsular India.

Elsewhere : Burma, Pakistan, Thailand, North and South Vietnam, Malaysia and Sri Lanka.

43. ***Eutropis trivittata*** Hardwicke & Gray
Five-lined skink

1827. *Tiliqua trivittata* Hardwicke & Gray, *Zool. Journ.*, **3** : p. 227 (type loc Dum-Dum, Bengal).

2002. *Eutropis trivittata* Mausfeld, *et al., Zoologischer Anzeiger*, **241** : 281-293.

Diagnosis : Dorsal and lateral scales subequal, with 5, sometimes in the adult 7, strong keels. Digits moderately long, with smooth lamellae, 13-14 beneath the fourth toe. Grayish-brown, with 3 broad, black-edged, white longitudinal stripes extending the whole length of the body and on the base of the tail. Lower parts white.

Distribution : India : Tamilnadu, Andhra Pradesh, Karnataka, Bengal, Bihar and Maharashtra.

Remarks : Endemic to Eastern Ghats, Western Ghats and Deccan.

44. ***Eutropis allapallensis*** Schmidt
Allapalli forest skink

1926. *Mabuya allapallensis* Schmidt, *Pub. Field. Mus. Nat. Hist. (Zool).*, **12** : p. 170 (type loc. Allapalli forest near Maharashtra Chanda, Central Provinces Chicago).

2002. *Eutropis allapallensis* Mausfeld, *et al., Zoologischer Anzeiger*, **241** : 281-293.

Diagnosis : Dorsum of this skink is very dark brown with black spots (in some individuals arranged in a vertebral series) between neck and base of tail, flanks brownish black with black spots. A white line from the upper lip to the shoulders. Belly is greenish white.

Distribution : India : Andhra Pradesh, Karnataka, Bihar, Madhya Pradesh and Goa.

Remarks : Endemic to central, eastern, western and Southern India.

45. ***Lygosoma punctata*** (Gmelin)
Dotted garden skink

1799. *Scincus punctatus* Gmelin, *Hist. Amphib.* : p. 197.

2003. *Lygosoma punctata*, Das, *J. Bombay nat. Hist. Soc.*, **100** (2&3) Aug-Dec. p. 447-501.

Material examined : 1 ex., Fatli, Kolar, 4. iii. 78. M. B. Rao, Coll.

Diagnosis : Larger and robust in habitus; ear-opening round; round; 72 scales along midline from nape to above vent; tail round, thick at base. Mid region of the body brassy white with four rows of black dots; three rows of small black dots from axilla to groin and on to tail; belly whitish.

Distribution : India : Whole of India.

Elsewhere : Sri Lanka

46. ***Lygosoma albopunctata*** (Gray)
White-spotted garden skink

1943. *Riopa albopunctata* Gray, *Ann. Mag. nat. Hist.*, **18** : p. 430 (type loc. Madras).

2003. *Lygosoma albopunctata* Das, *J. Bombay Nat. Hist. Soc.*, **100** (2&3) Aug-Dec. p. 447-501.

Diagnosis : Dorsum is generally reddish and each dorsal scale is with a prominent black or dark brown spot, it forming longitudinal lines.Sides of neck and anterior portion of body are dark brown or black, densely spotted with white. Belly is yellowish white and more elongated body.

Distribution : India : Andhra Pradesh, Kerala, Madhya Pradesh, Assam, Bengal, Bihar and Uttar Pradesh.

47. ***Lygosoma guentheri*** (Peters)
Gunther's garden skink

1879. *Eumeces guentheri* Peters, *Sitz. Ges. nat. Berlin Fr.* : p. 36 (type loc. Ostindien; Berlin).

2003. *Lygosoma guentheri* Das, *J. Bombay nat. Hist. Soc.*, **100** (2&3) Aug-Dec. p. 447-501.

Diagnosis : Body more elongate Dorsum with a dark spot for each scale which in the young coverage into longitudinal lines. Young with a light brown dorso-lateral streak, starting from the canthus rostralis is more prominent in juveniles and semiadults.

Distribution : India : Karnataka, Maharashtra, Goa and Kerala.

Remarks : Endemic to North Western Ghats.

48. ***Lygosoma lineata*** Gray
Lined garden skink

1839. *Chiamela lineata* Gray, *Ann. Mag. nat. Hist.*, **2** : p. 333 (type loc.India).

2003. *Lygosoma lineata* Das, *J. Bombay nat. Hist. Soc.*, **100** (2&3) Aug-Dec. p. 447-501.

Diagnosis : Body more elongate and small; from 104-110 scales down the middle of the back. Limbs weaker, each one with four digits only. Golden brown above with a series of black spots which usually coverage into longitudinal lines.

Distribution : India : Karnataka, Maharashtra and Pune.

Remarks : Endemic to North Western Ghats.

49. ***Kaestlea beddomii*** Boulenger

1887. *Lygosoma beddomii* Boulenger, *Cat, Liz Brit., Mus.* iii, p. 261. pl. xviii, fig. 3 (type loc. Travancore Hills; London).

2004. *Kaestlea beddomii* Eremchenko, V.K. & Das, I.. *Hamadryad.* **28**, 1-2, 43-50.

Diagnosis : Dorsum brown with two dark dorso-lateral stripes extending from post nasal region to the base of tail; lateral sides of tail were bluish; ventral, labial, gular, humeral and femoral scales grayish with a dark crescentic band. Para-vertebrals were lighter than lateral scales.Head depressed, body slender, neck slightly distinct, limbs moderately developed and relatively short. Tail relatively long.

Distribution : Travancore Hills ; Nilgiris (Coonoor).

50. ***Ristella beddomii*** Boulenger
Beddome's snake skink

1887. *Ristella beddomii* Boulenger, *Cat, Liz Brit., Mus.* p. 359, pl. 29, fig. 4 (type loc. S.W. India)

1935. *Ristella beddomii* Smith, *Fauna of British India*, **2** : p. 332.

Diagnosis : Dorsum is reddish brown but the dark lines on flanks are less and yellow spots are more distinct; most of the individuals are having large black blotch above the fore–limb. In most of the individuals light brown dorsal stripes remain distinct.

Distribution : India : Kerala and Karnataka.

Remarks : Endemic to Western Ghats.

Family 11. LACERTIDAE

51. ***Ophisops beddomei*** (Jerdon)
Beddome's lacertid

1870. *Pseudophiops beddomei* Jerdon, *P. Asiat. Soc. Beng.* : p. 72 (type loc. Bramagherry Hills, Wynaad).

1935. *Ophisops beddomei* Smith, *Fauna of British India*, **2** : 378.

Diagnosis : Normal head shields, united eyelids and pointed imbricate. Body scales strongly keeled. Tail cylindrical and femoral pores present. Olive-brown above and yellowish white below. A lateral streak running down the back to the tail and the space in between spotted with black.

Distribution : India : Karnataka, Maharashtra and Kerala.

Remarks : Endemic to Deccan and Western Ghats.

52. ***Ophisops jerdoni Blyth***
Snake-eyed lacertid

1853. *Ophisops jerdoni* Blyth, *J. Asiat. Soc. Beng.*, **22** : p 653. (type loc. Mhow, Indore Madhya Pradesh).

Material examined : 1 ex., Kondurajan Halli, Kolar, 11. iii. 78. M. B. Rao, Coll. 1 ex., Udugubandu, 9. xii. 2005, S. Prabakaran, coll.

Diagnosis : A fold in front of the shoulder, dark olive above and whitish below. Two lemon coloured stripes on the flanks which enclose dark transverse in the middle zone of the back.

Distribution : India : Tamil Nadu, Andhra Pradesh, Maharashtra, Kutch, Madhya Pradesh and Rajasthan.

Elsewhere : Pakistan.

53. ***Ophisops leschenaultii*** (Milne-Edwards)
Peninsular golden lacertid

1829. *Lacerta leschenaulti* Milne-Edwards, *Ann. Sci. nat.* Paris, xvi, pp. 80, 86, pl. fig. 9 (Type loc. Coromandel Coast; Paris).

2003. *Ophisops leschenaultii* Das, *J. Bombay nat.Hist.Soc* **100** (2&3) Aug-Dec.

Diagnosis : Brwnish or golden above, a light stripe edged above with black commences behind the supraciliary edge and passes along the side of the bodyand tail. A second borders the upper lip and passes along the flank ,the interval between the two light stripes being black or green spotted with black. Lower parts greenish white, tail and hind limbs often reddishin colour.

Distribution : India : From Chota Nagpur, Bihar to the plains of North India and the hills of South India.

Elsewhere : Sri Lanka.

Family 12. VARANIDAE

54. ***Varanus bengalensis*** (Linnaeus)
Indian monitor

1758. *Lacerta monitor* Linnaeus, *Syst. Nat. ed.* 10 : p. 201 (type loc. India).

1966. *Varanus bengalensis* Minton, *Bull. Amer. Mus.nat. Hist.*, **134** : p.112.

Diagnosis : Young dark olive above with numerous light spots or ocelli alternating with dark bars and whitish on the undersides with narrow dark transverse bars sometimes broken up into spots. Adult brownish or olive above with blackish dots on the back. Lower parts yellowish mottled with black.

Distribution : Whole of India.

Elsewhere : Burma, Nepal, Pakistan, and Sri Lanka.

Family 13. TYPHLOPIDAE

55. ***Ramphotyphlops braminus*** (Daudin)
Common blind snake

1803. *Eryx braminus* Daudin, *Hist. nat. Rept.* **7** : p. 279.

1990. *Ramphotyphlops braminus,* Murthy, *Rec. zool. Surv. India. Occ. Pap.* **114** : 5.

Material examined : 1 ex., Near Ramasamy pond, 13. ix. 2003, G. Thirumalai, Coll.; 1 ex., Mathesware kare, 14. ix. 2003, G. Thirumalai, Coll.; 1 ex., Thammanyakanahalli 10. xii. 2005, S. Prabakaran, coll.; 1ex., Balekola Mysore, 16. xii. 05, S. Prabakaran, Coll.1ex., Chamrajnagar 21. xii. 05, S. Prabakaran, Coll.1ex., Pecock Kere Nagerhole range, 9. xii. 07 R. Aengals, Coll.

Diagnosis : Snout is rounded and strongly projecting. Chestnut brown, above and paler

below, snout, chin and anal region creamy. The tail is short and ending with a spine.

Distribution : Throughout India, including Andaman and Nicobar Islands and the Lakshadweep.

Elsewhere : South Asia.

56. ***Typhlops beddomei*** Boulenger
Beddome's worm snake

1890. *Typhlops beddomei* Boulenger *F.B.I.*3.237, (Hills of S. India, London).

Diagnosis : Preocular separated from the anterior nasal; eye fairly distinguishable. 18 scales round the body; transverse rows of scales 180-200. Brown above sometimes with a dark vertebral line and pale below. Snout and anal region whitish. Tail ending in a point.

Distribution : India : Anaimalais; Hills of Tirunelveli and South Kerala.

Remarks : Endemic to Eastern Ghats &Western Ghats.

57. ***Typhlops porrectus*** Stoliczka
Slender Blind snake

1871. *Typhlops porrectus* Stoliczka, *J.A.S, Bengal* xl, 9. 426, pl. xxv, figs.1-4 (Bengal; type lost).

Material examined : 1ex., Kagglahalli; Harohalli range, 11. xii. 2005, S. Prabakaran, coll.

Diagnosis : Snout is rounded and strongly projecting nostrils lateral; scales round the body are 18; 400-440 transverse rows of scales overall body length. Blackish brown above and paler below, the snout is rounded strongly projecting and the chin and anal region is white in colour.

Distribution : Throughout India.

Elsewhere : Sri Lanka, Burma and Pakistan.

58. ***Grypotyphlops acutus*** (Dum. & Bibr.)
Beaked blind snake

1844. *Onychocephalus acutus* Dum. & Bibr, *Erp. Gen.* vi, p. 333 (type loc. Unknown; Paris).

2003. *Grypotyphlops acutus* Das, *J. Bombay nat. Hist. Soc.*, **100** (2&3) Aug-Dec.

Diagnosis : Snout pointed and hooked; nostrils inferior; rostral very large. Scales round the body 28-34. Transverse rows of scales 450-500, tail ending in a small spine. Brownish or blackish above, with pale yellow centres on dorsal and lateral scales. Underside paler.

Distribution : Anaimalais and Palghat Hills in the Western Ghats part of Tamil Nadu and Kerala. Also reported from Gujarat, Maharashtra, West Bengal, Bihar, Orissa and Andhra Pradesh,

Remarks : Endemic to Peninsular India.

Family 14. UROPELTIDAE

59. ***Plectrurus canaricus*** (Beddome)

1870. *Silybura canarica* Beddome, *Madras Month. J. Med. Sci.*, p. 170 (Kudra Mukh, nr. Mangalore; London).

1935. *Plectrurus canaricus* Smith, *Fauna of British India*, **2** : p. 72.

Diagnosis : Brownish-violet with yellow blotches anteriorly and with or without small yellow spots on the back. Lips yellow lower surface of tail yellow, with or without a black central streak.

Distribution : India : South Kannada district of Karnataka.

Remarks : Endemic to Western Ghats.

60. ***Plectrurus perroteti*** Dum.&Bibr.
Perrotet's shieldtail

1854. *Plectrurus perroteti* Dum. & Bibr. *Erp. Gen.* p. 167, pl. ix, fig. 4 (Nilgiris : Paris).

Material examined : 2 exs., Kotegetor, Mysore. 7. xi. 74, N. Krishnamurthy, Coll.

Diagnosis : Snout obtusely pointed; frontal as long as the parietals. Eye about half the length of the ocular shield. Scales in 15 rows; ventrals 152 – 180, caudals 6-12. Tail cmpressed; caudal scute compressed, with superposed bifid or trifid points. Dark- purplish brown above, paler below, each dorsal scale with a reddish or yellowish centre; a yellow line on the upper surface of the tail in the young.

Distribution : South India : Western Ghats: Anaimalais and Nilgiris.

Remarks : Endemic to Western Ghats.

61. ***Uropeltis ellioti*** (Gray)
Elliot's shieldtail snake

1845. *Siluboura ceylonicus* (not of Cuvier) Gray, *Cat. Liz. Brit. Mus.* p. 142 (Madras : London)

1943. *Uropeltis ellioti* Smith, *Fauna of British India*, **3** : p. 75.

Diagnosis : Dark brown with or without small yellow spots and larger ones below; a yellow line on each side of the neck; tail with a yellow stripe on each side united together with a crossbar in the anal region.

Distribution : India : Western Ghats (Tirunelveli Hills; Munnar); Eastern Ghats (Shevaroys, Javadi Hills and Ganjam Hills).

Remarks : Endemic to Eastern Ghats & Western Ghats.

62. ***Uropeltis ceylanicus*** (Gunther)
South Kerala shieldtail snake

1829. *Uropeltis ceylanicus* (not of Gray) Cuvier, Reg. Anim. 2nd ed., ii, p. 76 ("Ceylan"; Paris)

1943. *Uropeltis ceylanicus* Smith, *Fauna of British India*, **3** : p. 80

Material examined : 6 exs., Kotegetor, Mysore. 7. xi. 74, N. Krishnamurthy, Coll.

Diagnosis : Its snout is pointed. Dorsal colour is uniformly brownish or blackish, in some snakes transversely arranged spots are available, a yellow lateral stripe is also present in few individuals. Belly may be yellowish with or without dark brown or black spots. Ventral tail surface is brown and yellow on the lateral aspects.

Distribution : From Castle Rock to the hills of South Kerala, Western Ghats, Shevaroys, Eastern Ghats. Common in the hills of South Kerala.

Remarks : Endemic to Eastern Ghats & Western Ghats.

63. ***Uropeltis ocellatus*** (Beddome)
Ocellate shieldtail snake

1863. *Silybura ocellata* Beddome, *P. Z. S.* p. 225 (Wala Ghat, Nilgiris ; London).

1943. *Uropeltis ocellatus* Smith, *Fauna of British India*, **3** : p. 76.

Material examined : 3 exs., Kotegetor, Mysore. 7. xi. 74, N. Krishnamurthy, Coll.

Diagnosis : Yellowish or brown above, almost uniform or with transverse series of small, yellow, black edged ocelli arranged in rings. Brown below with large yellow spots or crossbars.

Distribution : India : Western Ghats south of the Goa gap; common in the Nilgiris and Anaimalais.

Remarks : Endemic to Western Ghats.

64. ***Uropeltis phipsoni*** (Mason)
Phipson's shieldtail

1888. *Silybura phipsonii* Beddome, *Ann. Mag. Nat. Hist.* (6) I, p. 184 (Bombay Ghats ; London). 1943. *Uropeltis phipsoni* Smith, *Fauna of British India*, **3** : p.82.

Diagnosis : Small Uropeltis, maximum length 280 mm, diameter of body 9 mm. Its snout is obtusely pointed; dorsum is brown, purple-brown may or may not be having yellow mottling or dots. A prominent yellow stripe on lateral aspects of neck and fore part of the body, lateral aspects of tail with yellow stripes which meet with a transverse bar across the anal region.

Distribution : India : Western Ghats from the Bombay Hills to the Anaimalai Hills Tamilnadu.

Remarks: Endemic to Western Ghats.

65. ***Melanophidium wynaudense*** (Beddome)
Wynaud Melanophidium

1863. *Plectrurus wynandense* Beddome, *P. Z. S.* p. 228 (nr. Manantoddy : London).

1943. *Melanophidium wynaudense* Smith, *Fauna of British India*, **3** : p. 67.

Diagnosis : A smaller eye; ventrals 170-185, caudals 10-18. Terminal scute with two superposed lateral ridges which meet on a transverse ridge at the tip. Iridescent black, with large white or yellow spots on the belly.

Distribution : Coorg, Karnataka and Mannanthoddy, Kerala.

Remarks : Endemic to Western Ghats.

66. ***Melanophidium punctatum*** Beddome
Pied-bellied shieldtail

1871. *Melanophidium punctatum* Beddome, *Madras Month. J. Med. Sci.* p. 401. (Travancore : London).

Diagnosis : A mental groove. No supraocular or temporal scutes. Snout obtuse; nostril short and broad. Eye one-third the length of the ocular scute. Ventrals 180- 198, caudals 11-18. Tail feebly compressed; caudal scute with two parallel ridges above that converges into two or four points at the tip. Iridescent black above; ventrals and lateral scales with black centres.

Distribution : Hills of South Kerala; Anaimalais; Telewady, Karnataka.

Remarks : Endemic to Western Ghats.

67. ***Rhinophis sanguineus*** Beddome
Red bellied shieldtail

1863. *Rhinophis sanguineus* Beddome *P. Z. S.* p. 227 (Cherambody, Malabar : London).

Diagnosis : Black above with a bluish tinge and small light spots. Lower parts and sides bright red, thickly spotted with black. Tail black above and red below.

Distribution : India : Western Ghats Part of Tamilnadu Kerala and Karnataka.

Remarks: Endemic to Western Ghats.

Family 15. BOIDAE

68. ***Gongylophis conicus*** (Schneider)
Common sand boa

1801. *Boa conica* Schneider, *Hist. Amphib.* ii, p. 268.

2004. *Gongylophis conicus* Whitaker & Captain; *Snakes of India–The Field Guide.*

Diagnosis : Yellow, brown or grey above with a dorsal series of large, irregular dark brown to sooty blotches which fuse with one another to form a zigzag stripe and another lateral series of scattered spots of the same colour. Belly whitish sometimes mottled with brown on the outer scale-rows. Males with well developed anal spurs and tail ending in a point.

Distribution : Throughout India.

Elsewhere : Pakistan, Nepal, Bangaladesh and Sri Lanka.

69. ***Eryx johnii*** (Russell)
Red sand boa

1801. *Boa johnii* Russell, *Ind. Serp.*ii, pp. 18 & 20, pls. xvi & xvii (Tranquebar).

2003. *Eryx johnii* Das, *J. Bombay nat. Hist. Soc.*, **100** (2&3) Aug-Dec. p. 447-501.

Diagnosis : Sandy grey or yellowish above, the scales edged with dark brown, or entirely brown above.Uniform or more or less distinct dark transverse bands; these bands usually distincton the tail. Lower parts whitish, spotted with dark brown.

Distribution : India : Throughout drier zones of the peninsular and the Northwest.

Elsewhere : Pakistan and Nepal.

70. ***Eryx whitakeri*** Das
Whitaker's boa

1991. *Eryx whitakeri Das, J. Bombay nat. Hist. Soc.*, **88**(1) : 92-97.1 pl.

Diagnosis : Small eye has vertical pupil. Brown blotched with darker brown. Having smooth or weakly keeled scales on top of its head and a blunt, rounded. Smooth scaled tail.

Distribution : India : Western Ghats part of Karnataka, Kerala, Goa and Maharashtra.

Remarks : Endemic to Western Ghats.

71. ***Python molurus*** (Linnaeus, 1758)
Indian python

1758. *Coluber molurus* Linnaeus, *Syst. Nat.* 10th ed. p. 225 (India).

1943. *Python molurus* Smith, *Fauna of British India,* **3** : p. 106.

Diagnosis : Light brown or grayish or yellow above with dorsal and lateral series of elongate large, rhomboidal darker blotches; head with a distinct spearhead-shaped dark mark, distinct only posterior on the crown and another streak of the same colour on either side of the head. Belly dirty whitish to yellow with black spots on the ventral. Underside of tail with orange and black.

Distribution : India

Elsewhere : Sri Lanka, Pakistan and Nepal.

Family 16 ACROCHORDIDAE

72. ***Acrochordus granulatus*** (Schneider, 1799)
Elephant trunk snake

1799. *Hydrus granulatus* Schneider, *Hist. Amphi.* i.p, 243 (India).

1943. *Acrochordus granulatus* Smith, *Fauna of British India*, **3** : p. 134.

Diagnosis : Head is not distinct from neck and is covered with small granular scales eyes are lateral in position. Dorsum is dark grey or somewhat blackish with whitish annulations all over the body. This annulations is more prominent on the dorsal aspect, bands are broaden comparatively than the bands present in the ventrum Dorsal aspect of head is dark grey lighter spots and posterior portion of body and tail are strongly compressed.

Distribution : India : The coastal waters of India.

Elsewhere : Indo-Australian Archipelago to the north coast of Australia and the Solomon Islands.

Family 17. COLUBRIDAE

73. Ahaetulla nasutus (Lacepede)
Common green whip snake

1789. *Coluber nasutus* Lacepede, *Hist. Nat. Serp.*, I, p. 100.

2003. *Ahaetulla nasutus* Sharma, Handbook-Indian Snakes, ZSI, Kolkata.

Material examined : 1 ex., Jog falls, North Kannara. 21. iv. 92, P. D. Rane, Coll.; 1ex., Karigrudana Koppalu Hassan. 27. xii. 05, S. Prabakaran, Coll.

Diagnosis : Dorsaly parrot-green and pale green on the lower parts. Flanks with a white or yellow line; interstitial skin with an oblique series of black and white lines that are most evident anteriorly; lips yellowish. Throat whitish or sometimes pale bluish.

Distribution : India : Peninsular India except Ganges Valley west of Patna and Bengal.

Elsewhere : Burma and Sri Lanka.

74. ***Ahaetulla pulverulenatus*** (Dum. & Bib.)
Brown whip snake

1854. *Dryinus pulverulentus* Dum. & Bib., *Erp. Gen.* vii, p. 812

2003. *Ahaetulla pulverulentus* Sharma, Handbook-Indian Snakes, ZSI, Kolkata.

Diagnosis : Dorsally grey or brown, heavily flecked with brown, and with black spots. Head with a dark brown rhomboidal spot and brownish stripes on the sides, both of which are characteristic of the species.

Distribution : India : Gujarat Junagarh and Dangs districts;Western Ghats (Karwar, North Kannada, and Castle Rock, Nilgiris and Nellampatty hills Travancore).

Elsewhere : Sri Lanka.

75. ***Amphiesma beddomei*** (Gunther)
Beddom's olive-brown keelback

1864. *Tropidonotus beddomei* Gunther, *Rept. Brit. Ind.*, P. 269, pl. xxii, fig. E (nom.nov.for vittatus preoc).

2003. *Amphiesma beddomei* Sharma, Handbook-Indian Snakes, ZSI Kolkata.

Diagnosis : Dorsally olive brown and whitish below mottled with brown with brown on the sides. The dorsal pattern consists of a series of yellow spots, each one enclosed by two black spots or short transverse bars, along each side of the back. Belly whitish and closely dotted with brown on the sides.

Distribution : Western Ghats. (From Maharastra to Kerala).

Remarks : Endemic to Western Ghats.

76. ***Amphiesma monticola*** (Jerdon)
Western green keelback

1871. *Tropidonotus monticolus* Jerdon, *J.A.S, Bengal,* xxii, p. 530 (Wynad :type lost). **9** : 426.

2003. *Amphiesma monticola* Sharma, Handbook-Indian Snakes, ZSI, Kolkata.

Diagnosis : Green above and white below. The dorsal pattern consists of wide-black crossbars or quadrangular black spots. Intercepted by two series of light dorsum lateral spots or lines. Head with a white or yellow cross-bar and a white dot on

each side of the frontal; pre and postoculars and labials surrounding the eye white. Throat and sides of neck yellow in life.

Distribution : India : Western Ghats from Talewadi, Goa frontier to Travancore, Kerala).

Remarks : Endemic to Western Ghats.

77. ***Amphiesma stolata*** (Linn.)
Buff-Striped Keel back

1758. *Coluber stolatus* Linnaeus, *Syst. Nat.* 10th Ed. p. 219.

2003. *Amphiesma stolata* Sharma, Handbook-Indian Snakes, ZSI, Kolkata.

Diagnosis : Olive-greenish or brown above with dark brown spots or cross-bars on the back and two lateral buffs or yellowish stripes best marked on the hinder part. Head olive, sides of the head, lips and area surrounding the chin white or yellow and neck with a black 'V'. Belly whitish, speckled with brown on the side of each ventral scale.

Distribution : India : Whole of India.

Elsewhere : Thailand, South China, Sri Lanka and Pakistan.

78. ***Argyrogena fasciolatus*** (Shaw)
Banded racer

1802. *Coluber fasciolatus* Shaw, *Gen Zool.* iii, p. 528.

2003. *Argyrogena fasciolatus* Sharma, Handbook-Indian Snakes, ZSI Kolkatta.

Material examined : 1ex., Balekola Mysore. 16. xii. 05. S. Prabakaran, Coll.

Diagnosis : Light or dark brown above and white or yellowish below. Young with blackish cross bars and white striations in the anterior half of the body. Head with two white spots above.

Distribution : India : Throughout India.

Elsewhere : Sri Lanka, Pakistan, Nepal and Bangladesh.

79. ***Atretium schistosum*** (Daudin)
Olivaceous keelback

1803. *Coluber schistosus* Daudin, *Hist. Nat. Rept.* vii, p. 132.

1943. *Atretium schistosum* Smith, *Fauna of British India*, **3** : p. 319.

Diagnosis : Dorsally olive green and uniform yellow below, the flanks being tinged with a light pink. Upper lip yellow and specimens from South India often with a reddish streak down the body.

Distribution : India : Whole of India except Himalayas.

Elsewhere : Sri Lanka.

80. ***Rhabdops olivaceus*** (Beddome)
Olive forest snake

1863. *Ablabes olivaceus* Beddome, *Madras Quart. J. Med. Sci.* vi, p.2 (Manantoddy, Malabar District ; London).

1943. *Rhabdops olivaceus* Smith, *Fauna of British India,* **3** : p. 328.

Diagnosis : Dorsal coloration is olivaceous or yellowish brown, ventral aspect of the snake is also of the same colour pattern. Two dorsolateral and two lateral longitudinal series of smallblack spots are present.Ventral shields are indistinctly edged with dark brown.

Distribution : India : Western Ghats, south up to Palghat.

Remarks : Endemic to Western Ghats.

81. ***Boiga trigonata*** (Schneider)
Common cat snake

1802. *Coluber trigonatus* Schneider, in Bechst. Transl. Lacep. iv, p. 256, pl.xl, fig. 1 (Vizagapatanam).

1943. *Boiga trigonata* Smith, *Fauna of British India*, 3 : p. 349.

Diagnosis : Light brown above and white below, with brown spots on the sides. Dorsal pattern consists of a vertebral series of 40-50 irregular, transverse white bars edged with black, more prominent anteriorly and fading towards tail. Head with a distinct 'Y' mark above. A dark stripe from behind eye to gape of mouth.

Distribution : India : Throughout India.

Elsewhere : Sri Lanka and Pakistan.

82. ***Boiga forsteni*** (Dum. & Bibr.)
Forsten's cat snake

1854. *Triglyphodon forsteni* Dum. & Bibr., *Erp. Gen.* vii, p. 1077.

1943. *Boiga forsteni* Smith, *Fauna of British India,* **3** : p. 358.

Diagnosis : Brown or reddish above with a series of large angular black spots or crossbars which are most distinct anteriorly and whitish or heavily speckled with brown on the underside. Head with a black bar.Nape with two stripes of the same hue, a broad black stripe from the eye to gape.

Distribution : India : Western Ghats, Eastern Ghats, Gahnges Valley and Eastern Himalayas.

Elsewhere : Sri Lanka.

83. ***Boiga ceylonensis*** (Gunther)
Ceylon cat snake

1858. *Dipsadomorphus ceylonensis* Gunther, *Cat. Col. Sn. Brit. Mus.* P. 176 (Ceylon ; London).

1943. *Boiga ceylonensis* Smith, *Fauna of British India,* **3** : p. 351.

Diagnosis : Greyish–brown above and yellow white on the underside, with dark brown spots on the sides. The dorsal pattern comprises of a series of chocolate–brown spots which sometimes continue as transverse bars on the body. A dark blotch or transverse bar on the nape and a dark stripe from eye to gape are present.

Distribution : India : Western Ghats, Orissa, Assam and Andaman Islands.

Elsewhere : Pakistan, Bangladesh and Sri Lanka up to Australia.

84. ***Boiga beddomei*** (Wall)
Beddome's Cat Snake

1909. *Dipsadomorphus beddomei* Wall, *Rec. Ind. Mus.* iii, p. 152 (Ceylon, Kandy, Matheran).

1943. *Boiga beddomei* Smith, *Fauna of British India,* **3** : p. 351.

Diagnosis : Dorsally greyish or yellowish–brown with a series of dark brown to blackish blotches; belly white, speckled with dark brown or black and with black lines on the outer edges of some ventrals. There is usually a stripe on each side of the head, commencing from behind the eye to the mouth.

Distribution : India : Western Ghats.

Elsewhere : Sri Lanka.

85. ***Boiga nuchalis*** (Gunther)

1875. *Dipsas nuchalis* Gunther, *P. Z. S.* p. 233 (West coast of India; London) *Rec. Ind. Mus* iii, p. 152

1943. *Boiga nuchalis* Smith, *Fauna of British India,* **3** : p. 351.

Diagnosis : Greyish–brown above with a series of dark brown to blackish blotches; belly white, speckled with dark brown or black and with black lines on the outer edges of some ventrals. Usually a stripe on each side of the head, commencing from behind the eye to the mouth.

Distribution : India : Western Ghats.

Elsewhere : Nepal.

86. ***Cerberus rhynchops*** (Schneider)
Dog faced water snake

1799. *Hydrus rhynchops* Schneider, *Hist. Amph.* i, p.246 (based on Russell, pl. xvii).

1943. *Cerberus rhynchops* Smith, *Fauna of British India,* 3 : p. 393.

Diagnosis : Head is distinct from neck; snout is long but broadly rounded. Dorsal is grayish or brownish or olivacious, with dark spots or cross bars. Lateral aspect of head is with black streaks, which passthrough the eye and on the neck. Ventral blackish or dark gray.

Distribution : Coasts and tidal rivers of India.

Elsewhere : Nepal and Sri Lanka.

87. ***Gerardia prevostiana*** (Eydoux & Gervais)
Glossy marsh snake

1832-1837. *Coluber (Homalopsis) prevostianus*, Eydoux & Gervais in *Guer. Mag. Zool. Cl.* iii, p. 5, col.pl. 15 ("Manila").

1943. *Gerardia prevostiana* Smith, *Fauna of British India,* **3** : p. 394.

Diagnosis : Light or dark grey or brown above, uniform upper lip. Chin and three outer rows of scales white. Ventrals whitish with dark edges or entirely grey.

Distribution : India : Coasts and tidal rivers of India.

Elsewhere : Sri Lanka, Burma and West coast of the Malay Peninsula.

88. ***Dendrelaphis tristis*** (Daudin)
Common Indian bronze-back

1803. *Clouber tristis* Daudin, *Hist. Nat. Rept.*vi, p. 430. (based on Russell's pl. 31).

2003. *Dendrelaphis tristis* Sharma, Handbook-Indian Snakes p. 113.

Material examined : 1ex., Chamrajnagar. 21. xii. 05. S. Prabakaran, Coll.;1ex., Devrayandurga Tumkur. 22. ix. 07. S. Prabakaran, Coll.

Diagnosis : Dorsally bronze-brown of purplish-brown with a buff lateral stripe edged with black extending from the head to the vent. Scales on the neck and fore body yellow; upper lip yellow. Head with a dark temporal band extending onto the neck, where it may break up into vertical bars. Belly grey, light green or whitish.

Distribution : India : Throughout India.

Elsewhere : Sri Lanka.

89. ***Dendrelaphis pictus*** (Gmelin) sensu Whitaker & Captain, 2004
Painted bronze-back

1789. *Coluber pictus* Gmelin, *Syst. Nat.* i, p. 1116.

2003. *Dendrelaphis pictus* Sharma, Handbook-Indian Snakes p.108.

Diagnosis : Dorsum is broze-brown ventrum is creamy white yellowish or bluish. A yellow or cream coloured, black bordered stripe on the flank along scale rows 1 and 2. Head is with a black stripe running along the temple on to the neck, where it breaks up into oblique bars. Upper lip and lower jaw yellow.

Distribution : Southern India (in the sense of Whitaker & Captain, 2004).

Elsewhere : Southeast Asia.

90. ***Dendrelaphis grandoculis*** (Boulenger)
Large-eyed bronzeback tree snake

1890. *Dendrophis grandoculis* (Boulenger) F. B. I. p. 337 (Tinnevelly Hills & Coonoor Ghat, S. India: London).

2003. *Dendrelaphis grandoculis* Sharma, Handbook-Indian Snakes, ZSI, Kolkata p.112.

Diagnosis : Olive brown above with small black blotches, no lateral body stripes. Head without dark temporal stripe; belly olive, darker behind than in front, dotted with fine black spots on the sides. Tail with 3 black lines two lateral and one below.

Distribution : Southwestern Ghats.

Remarks : Endemic to Western Ghats.

91. ***Chrysopelea ornata*** Shaw
Golden tree snake

1802. *Coluber ornatus* Shaw, Gen. Zool. Iii, p .477 (based on Seba, I, t.7, and ii,t.7,f.1 and t,61,f, 2 : East India Islands).

1943. *Chrysopelea ornata* Smith, *Fauna of British India*, **3** : p. 251.

Diagnosis : Young black above with pale greenish yellow crossbars which may or may not dilate vertebral and on the sides; scales with or without a median streak. Adult jet black with conspicuous yellow or white crossbars and a single series of large reddish vertebral rosettes; belly greenish, lateral shields with a black spot or edged with black. Head black with yellow crossbars or spots.

Distribution : India : Bihar, West Bengal, Orissa, Madhya Pradesh and Western Ghats.

Elsewhere : Bangladesh and Sri Lanka.

92. ***Coelognathus helena*** (Daudin)
Trinket snake

1803. *Coluber helena* Daudin, *Hist. Nat. Rept.* vi, p. 277.

2003. *Coelognathus helena* Das, *J. Bombay nat. Hist. Soc.*, **100** (2&3) Aug-Dec.pp 446-501.

Diagnosis : Dark brown above and pearly white or yellowish bellow. The distinctive dorsal pattern consists of black cross–bars that enclose three or more white islets resembling trinkets. This pattern is most conspicuous anteriorly and on the sides but disappears on the hinder part, which is flanked by thick dark stripe on each side. Nape with two dark streaks above which may join to form an inverted 'V'; eye with two black streaks–one below it and another oblique one behind.

Distribution : Throughout India.

Elsewhere : Sri Lanka; West Pakistan.

93. ***Coelognathus helena monticollaris*** Schultz
Montane trinket snake

2004. *Coelognathus helena monticollris* Schultz Whitaker, R.& Captain. A. *Snakes of India.* The Field Guide. Draco Books, Chengalpattu, Tamilnadu xiv+479, pls. text. figs.

Diagnosis : Slender-bodied. Scales of hind body and tail sometimes keeled. Tan or olive, and chocolate brown with a banded forebody. The bands consist of several rows of large pale yellow oval or round spots encircled with black. Hind body has lateral stripes. Belly white, with a serious of black (often bracket-shaped)markings on each side.

Distribution : India : Western Ghats part of Karnataka, Kerala, Goa and Maharashtra.

Remarks : Endemic to Western Ghats.

94. ***Liopeltis calamaria*** (Gunther)
Lesser stripe-necked snake

1858. *Cyclophis calamaria* Gunther, *Cat. Col. Sn. Brit. Mus.* P. 250 (Ceylon; London).

2003. *Liopeltis calamaria* Das, *J. Bombay nat. Hist. Soc.,* **100** (2&3) Aug-Dec. pp. 446-501.

Materials examined : 1 ex., Chintamani Road, Kolar. 24. iii. 78, M.B. Rao, Coll.

Diagnosis : Light brown to olive dorsally with a series of longitudinal stripes, two of which are most evident in the vertebral region. Head with a lateral series of dark spots on each side; lower parts yellow.

Distribution : India : Western Ghats part of Tamilnadu and Karnataka and few districts of Uttar Pradesh and Bihar.

Elsewhere : Sri Lanka.

95. ***Lycodon aulicus*** (Linnaeus)
Common wolf snake

1754. *Coluber aulicus* Linnaeus *Mus. Adolph. Frider.* i, p. 29 pl, xii, fig. 2(America (in error) : type in Stockholm).

1943. *Lycodon aulicus,* Smith, *Fauna of British India*, **3** : p. 263.

Material examined : 1 ex., Chintamani road, Kolar, 24. iii. 78. M. B. Rao, Coll.; 1ex., Chamrajnagar, Karnataka. 21. xii. 05. S. Prabakaran, Coll.

Diagnosis : Dark brown or purple above and yellowish on the underside; upper lip white or brown spotted. The dorsal pattern consists of 12-19 white or yellowish crossbars that expand laterally or bifurcate; this pattern may persist over the entire body, most evident anteriorly or it is sometimes reduced to vertebral spots. A triangular white blotch on each side of the occipital, which may tend to fuse with one another.

Distribution : India : Indian subcontinent.

Elsewhere : Maldive Islands, Myanmar through Indochina, South China, Malaysia, Indonesia and Philippines.

96. Lycodon striatus (Shaw)
Barred wolf snake

1802. *Coluber striatus* Shaw, *Gen. Zool.*iii, p. 527 (based on Russell's pl. xvi).

1943. *Lycodon striatus* Smith, *Fauna of British India*, 3 : p. 261.

Diagnosis : Dark brown or blackish above with 11-18 white or yellowish crossbars which expand laterally and sometimes also dorsally; the expanded crossbars on the sides of the body enclose triangular spots; upper lip and lower parts white.

Distribution : Peninsular India.

Elsewhere : Sri Lanka, Pakistan, Afghanistan and Iran.

97. ***Lycodon travancoricus*** (Beddome)
Travancore wolf snake

1870. *Cercaspis travancoricus* Beddome *Madras Monthl.J. Med. Sci.,* ii, p.169 (Travancore Hills : London).

1943. *Lycodon travancoricus*, Smith, *Fauna of British India*, **3** : p. 259.

Material examined : 2exs., Palahalli Srirengapattinam, 14. xii. 05. S. Prabakaran, Coll.; 2exs., Balekola Mysore, 16. xii. 05. S.Prabakaran, Coll.; 1ex., Kavaladurga tank Thirthahalli range Shimoga. 19. xii. 07. R. Aengals, Coll.

Diagnosis : Dark purplish-brown or blackish above and white below. The dorsal pattern consists of a series of pale yellow cross-bars that commence at the nepe. The bars on the anterior part of the body are separted by wider interspaces than those on the posterior; upper lip brow, speckled with white.

Distribution : India : Tamil Nadu, Kerala, Andhra Pradesh, Orissa, Maharastra and Madhya Pradesh.

Remarks : Endemic to Eastern Ghats & Western Ghats and Deccan.

98. ***Macropisthodon plumbicolor*** (Cantor)
Green keelback

1839. *Tropidonotus plumbicolor* Cantor, *P. Z. S.* p. 54 (type loc. Malwa (saugor), C-I. : drawing in Bodleian Lib., Oxford).

1943. *Macropisthodon plumbicolor* Smith, *Fauna of British India*, **3** : p. 314.

Diagnosis : Dorsally grass-green with regular transverse dark spotswhich may form cross-bars on the back and tail. A black streak from the eye to the angle of mouth; belly whitish or olive-brown with or without dark spots. The well-defined dark crossbars on the back, they have a large. A shaped mark on the nape with its apex directed forwards and a second much smaller one behind, the intervening area being bright yellow or orange.

Distribution : India : Throughout India except the Ganges Valley and the extreme north-west.

Elsewhere : Sri Lanka.

99. ***Oligodon arnensis*** (Shaw)
Common kukri snake

1802. *Coluber arnensis* Shaw, *Gen. Zool.* iii, p. 526 (based on Russell's fig. 38).

1943. *Oligodon arnensis* Smith, *Fauna of British India,* **3** : p. 225.

Material examined : 1ex., Poodhipadugai, Chamrajnagar. 20. xii. 05, S. Prabakaran, Coll.

Diagnosis : Pale brown or orange above and uniform yellowish below or with indistinct brown spots. The dorsal pattern consists of well defined black cross-bands-18.30 on the body and 4-16 on the tail; these bands however vary in number and width and may be edged with white. Head with 3 chevron-shaped marks.

Distribution : India : Peninsular India.

Elsewhere : Pakistan and Sri Lanka

100. ***Oligodon affinis*** Gunther
Western kukri snake

1862. *Oligodon affinis* Gunther *Ann. Mag. nat. His.,* (3) ix, P. 58. (Anaimallayas: London).

Diagnosis : Brown above with an indistinct reticulatioin of darker markings and about 30-41 dark brown crossbars and whitish below with square black spots. Head with dark symmetrical transverse markings, which are connected by median longitudinal stripes.

Distribution : India : Western Ghats south of Goa.

Remarks : Endemic to Western Ghats.

101. ***Oligodon brevicaudus*** Gunther
Striped kukri snake

1862. *Oligodon brevicauda* Gunther, *Ann. Mag. nat. His.,* (3) ix, P.58. (Anaimallayas : London).

2003. *Oligodon brevicaudus* Das, *J. Bombay nat. Hist. Soc.,* **100** (2&3) Aug-Dec.

Diagnosis : Brown above with a light vertebral stripes which is bordered on each side by a dark brown or black strips; these stripes may or may not be marked with paired series of spots or short bars on the anterior part of the body; brownish or whitish below (red in life) with large quadrangular or transverse black spots. Head with a crescentic band in front and a temporal stripe; a large dark nuchal spot.

Distribution : India : Nilgiris, Anaimalais and Hills of South Kerala, Western Ghats.

Remarks : Endemic to Western Ghats.

102. ***Oligodon taeniolatus*** (Jerdon)
Russull's kukri snake

1853. *Coronella taeniolata* Jerdon, *J.A.S. Bengal.* p. 528.

1943. *Oligodon taeniolatus* Smith, *Fauna of British India,* **3** : p. 223.

Material examined : 1 ex., Hosangadi, South Kannara. 2. ix. 91 S. Kamble, Coll.

Diagnosis : Dorsally buff or pale brown, with a series of large rhomboidal dark spots, or transverse bands of paired spots with or without a vertebral stripe interrupting them. Head with dark markings, typical of a kukri snake.

Distribution : India : Throughout India.

Elsewhere : Nepal, Bangladesh, Pakistan and Sri Lanka.

103. ***Oligodon venustus*** (Jerdon)
Black-spotted kukri snake

1853. *Xenodon venustum* Jerdon, *J.A.S. Bengal,* xxii, p. 523 (North Canara dist).

1943. *Oligodon venustus* Smith, *Fauna of British India,* **3** : p. 222.

Diagnosis : Greyish-brown above and yellowish or whitish on the underside with large irregular blackish spots on the back and smaller blackish spots on the sides. Head markings consist of a crescentic anterior cross-band, an oblique bar on each side and a broad angular band on the nape.

Distribution : India : Western Ghats south of the Goa Gap. A common snake in the Wynaad district of Kerala.

Remarks : Endemic to Western Ghats.

104. ***Ptyas mucosus*** (Linnaeus)
Rat snake

1758. *Coluber mucosus*, Linnaeus, *Mus. Ad. Frid. i*, p. 37. pl. 23 and *syst. Nat. Ed.* 10, p. 226 (India : stock holm)

1943. *Ptyas mucosus* Smith, *Fauna of British India,* **3** : p. 159.

Material examined : 1 ex., Niliker forest, South Kannara. 10. ix. 91. S.S. Kamble, Coll.

Diagnosis : Usually greenish or yellowish-brown above with black irregular cross-bars that often tend to fuse and form a reticulate pattern, at least on the posterior half of the body including the tail. Yellowish or whitish below, the yellowish tinge being more pronounced near the throat. Upper and lower labials, scales on the side of throat and underside of tail margined with black.

Distribution : India : Throughout India.

Elsewhere : Sri Lanka, Baluchistan, Afghanistan, Java and Sumatra.

105. ***Sibynophis subpunctatus***
(Dumeril & Bibron)
Dumeril's black-headed snake

1854. *Oligodon subpunctatus* Dumeril & Bibron, *Erp. Gen.* vii, p. 58 (Madras : Paris).

1943. *Sibynophis subpunctatus* Smith, *Fauna of British India,* **3** : p. 279.

Diagnosis : Head and nape black above; lips yellow and spotted; a yellow transverse bar between the eyes and two broad bars bordering the band on nape; dorsum light known with a vertebral series of black spots; lower parts yellow with black spots on outer border of each ventral scale.

Distribution : India : Western Ghats, Madhya Pradesh and West Bengal.

Elsewhere : Sri Lanka, Bangladesh and Nepal.

106. ***Xenochrophis piscator*** (Schneider)
Checkered keelback

1799. *Hydrus piscator* Schneider, *Hist. Amph.* I, p. 247 (East Indies : Based on Russell's "Neeli Koea").

2003. *Xenochrophis piscator* Sharma, Handbook-Indian Snakes p.108.

Material examined : 1 ex., Srinivasapur, Kolar. 12. iii. 78 M.B. Rao, Coll.; 1 ex., Kollur range, 17. xii. 07. R. Aengals, Coll.

Diagnosis : Usually olive, yellow or brown above, with a distinct pattern of numerous black and white spots arranged like a chessboard which is the source of the snake's common name; belly white or yellow. Head olive brown, with two black lines behind the eye on each side; a dark stripe on the nape.

Distribution : India : Throughout India.

Elsewhere : Nepal, Bangaladesh, Bhutan, Pakistan and Sri Lanka.

Family 17. ELAPIDAE

107. ***Calliophis melanurs*** (Shaw)
Slender coral snake

1802. *Coluber melanurus* Shaw, *Gen. Zool.* iii, p. 552 (based on Russell's plate).

1943. *Callophis melanurus* Smith, *Fauna of British India*, **3** : p. 420.

Diagnosis : Light brown above with the centre of each dorsal scale speckled with brown, which unite to form a series of longitudinal lines down the entire length. Head and neck black above with yellow spots. Tail with two black rings, one at the base and the other at the tip. Belly red.

Distribution : India : Throughout India except the Northwest.

Elsewhere : Sri Lanka.

108. ***Calliophis beddomei*** Smith
Beddome's coral snake

1890. *Hemibungarus nigrescens,* Boulenger, F.B.I. p. 384. (part).

2003. *Calliophis beddomei* Das, *J. Bombay nat. Hist. Soc.,* **100** (2&3) Aug-Dec.

Diagnosis : Light purplish-brown above and whitish below. Dorsal pattern consists of two more or less regular vertebral series of black, white-edged spots, which are either separated or united. Sides with two or more smaller series of black spots.

Distribution : India : Eastern Ghats, Tamil Nadu and Koppa, Karnataka.

Remarks : Endemic to Western Ghats and Eastern Ghats.

109. Calliophis nigrescens Gunther
Striped coral snake

1862. *Callophis nigrescens* Gunther, *Ann. Mag. nat. Hist.* (3) ix, p.131.

2003. *Calliophis nigrescens,* Das, *J. Bombay nat. Hist. Soc.,* **100**(2&3) Aug-Dec.

Diagnosis : Most elongate species of all the Indian coral snakes reaches to a length of about 900 mm.,with circumference of about 25 mm ; dorsal colouration is blakish , with a white oblique bar on the nape. Dorsum is with 5 black stripes ; a white stripe emerges from behind the eye and reaches up to the angle of the mouth . Ventrum is coral red.

Distribution : India : Gujarat Dangs district of (Saputara) Western Ghats (Nilgiri, Anaimalai and other hilly areas), Panchgani.

Remarks : Endemic to India.

110. ***Calliophis bibroni*** (Jan)
Bibron's coral snake

1858. *Elaps bibroni* Jan, *Rev. & Mag. Zool.* x, p. 526.

2003. *Calliophis bibroni* Das, *J. Bombay nat. Hist. Soc.,* **100** (2&3) Aug-Dec.

Diagnosis : Ground colour varies from cherry-red to dark purplish-brown. Back marked with black crossbars. Head black in front and red behind. Belly red with large black spots, which may unite with the bars on the back to form rings that encircle the body.

Distribution : India : Western Ghats and Coorg, Karnataka.

Remarks : Endemic to Western Ghats.

111. ***Bungarus caeruleus*** (Schneider)
Common Indian krait

1801. *Pseudoboa caerulea* Schneider, *Hist. Amphib.* ii, p. 284 (based on Russell).

1943. *Bungarus caeruleus* Smith, *Fauna of British India,* **3** : p. 413.

Diagnosis : Black or bluish–black above with about 40 thin, white crossbars that may, sometimes be indistinct or absent anteriorly. However, the pattern is complete and well defined in the young, which have crossbars on the fore body. In old individuals, the white lines may be found as a series of connected spots with a prominent spot on the vertebral region. A white preocular spot present.

Distribution : Throughout India.

Elsewhere : Pakistan and Sri Lanka.

112. ***Naja naja*** (Linnaeus)
Indian cobra

1758. *Coluber naja* Linnaeus, *Syst. Nat.* 10th ed. P.221, based on Seba, Thes.i,1734 ,pl.44, figs.i &ii.

2003. *Naja naja* Das, *J. Bombay nat. Hist. Soc.*, **100** (2&3) Aug-Dec.

Material examined : 1 ex., Moyar river bank, Masinagudi, Bandipur N.P. 22. ix. 89 G.M.Yazdani, Coll. 1 ex., Kapinaka bridge, Dharmasala Karkala, South Kannara 12. ii. 92. P.P. Kulkarni, Coll.

Diagnosis : Light to dark brown above with pale reticulations and white or yellowish below. Apart from the well-defined "spectacle" mark on the expanded hood. Cobra can be distinguished from other land snakes by the presence of a dark spot on either side of the lower surface of the hood and two or more broad black cross bands further below.

Distribution : Throughout Indian Subcontinent.

Elsewhere : Sri Lanka.

113. ***Ophiophagus hannah*** (Cantor)
King cobra or Hamadryad

1836. *Hamadryas hannah* Cantor, *Asiat. Research*, xix, p. 187, pls.10-11 (Sundarbans, near Calcutta).

2003. *Ophiophagus hannah* Sharma, Handbook-Indian Snakes p. 199.

Diagnosis : Coloration varies from olive green to yellowish but the tail is sometimes jet black. Dorsal pattern consists of 30-40 lighter bands on the body and 10-12 on the tail; but these bands are prominent in the juveniles and fade out or become obscure in the adults. Throat is light yellow or creamy. Venter is a paler shade of the dorsum. Young are jet black with chevron-shaped yellow transverse bands on the head, body and tail.

Distribution : Peninsular India to the Western Himalayas.

Elsewhere : Burma, Philippines, Hong Kong, Southern parts of China, Thailand.

Family 18. HYDROPHIIDAE

114. ***Kerilia jerdonii*** Gray 1849
Jerdon's sea snake

1849. *Kerilia jerdoni* Gray, *Cat. Sn. Brit. Mus.* p. 57 (Madras; London).

2003. *Kerilia jerdonii* Das, *J. Bombay nat. Hist. Soc.*, **100** (2&3) Aug-Dec.

Diagnosis : Olive above, yellowish or white beneath, with black dorsal spots or rhombs which extent round the body to form complete bands. Intermediate dorsal spots or bars are usually present.

Distribution : The east coast of the Indian Peninsula.

Elsewhere : East coast of Cochin China and South Annam and Borneo.

115. ***Enhydrina schistosa*** Daudin
Hook-nosed sea snake

1801. *Enhydrina schistosus* Daudin, *Hist. Nat. Rept.* vii, p. 386 (based on Russel, ii, pl. x ; Tranquebar).

1943. *Enhydrina schistosa* Smith, *Fauna of British India,* **3** : p. 449.

Diagnosis : Dorsal colouration is gray or grayish with a bluish tinge, with dark gray or black annulation, which are broadest on the dorsum and ventrum is whitish. Colour pattern is most conspecious in juveniles and as the age increase all the markings vanish or become faint and the complete snake becomes uniform gray.

Distribution :India : Coastal waters of Gujarat, Goa, Orissa, West Bengal Tamilnadu and Karnataka.

Elsewhere : Gulf of Oman, Seychelles, South Vietnam, North coast of Australia, Rockhampton coast, Coast of Burma and Sunday Bay in Thailand.

116. ***Hydrophis cyanocinctus*** Daudin
Annulated sea snake

1803. *Hydrophis cyanocinctus* Daudin, *Hist. Nat. Rept.* vii, p. 383.

Diagnosis : Head is black or dark olive, often with a light horoeshoe-shaped mark above. As age advances the ventral stripe and ventral portion of the annulus become less distinct, and in the adult may be entirely lost; the head with age becomes olivaceous or yellowish; the horseshoe-shaped mark does not persist.

Distribution : West coast of Indian Peninsula, east coast of India.

Elsewhere : Person Gulf of to the Idzu Sea of Japan; Sri Lankan coast; islands of Indonesia; Gulf of Siam; the Burmise coast and coastal areas of Pakistan.

117. ***Hydrophis spiralis*** Shaw
Yellow sea snake

1802. *Hydrus spiralis* Shaw, *Gen. Zool.* iii, p. 564, pl. (Indian Ocean : London).

1943. *Hydrophis spiralis* Smith, *Fauna of British India*, **3** : p. 453.

Diagnosis : Yellowish or yellowish-green, the dorsal scales with black margins and with more or less complete narrow black annuli much narrower than their interspaces and feebly dilated vertebrally. Dorsal spots often present between the bands. Head in the young blackish, with a yellow horseshoe-shaped mark above. In the adult usually entirely yellow.

Distribution : All coasts of India.

Elsewhere : From the Persian Gulf to the Malay Peninsula an Archipelago.

118. ***Hydrophis ornatus ornatus*** (Gray 1842)
Pale-greyish sea snake

1842. *Aturia ornata Gray, Zool.* Misc. p. 61 (Indian Ocean : London).

1943. *Hydrophis ornatus ornatus* Smith, *Fauna of British India*, **3** : p. 460.

Diagnosis : Dorsal colour is pale greyish or olivaceous some times almost white, above with broad dark bars or rhomboidal spots separated by narrow interspaces. Below yellowish or whitish. Head is olivaceous.

Distribution : India : Coasts of India

Elsewhere : From the Persian Gulf to the China and the coast of New Guinea.

119. ***Hydrophis caerulescens*** (Shaw, 1802)
Many toothed sea snake

1802. *Hydrus caerulescens* Shaw *Gen. Zool.* iii. p. 561 (Indian Ocean).

1943. *Hydrophis caerulescens* Smith, *Fauna of British India*, **3** : p. 463.

Diagnosis : Bluish grey above, yellowish white below with fourty to sixty broad bands, about twice as broad as their interspaces on the fore part of the body, tapering towards the belly, where they may be incomplete on the thicker part of the body.With age these marking usually become indistinct and in some old individuals are scarcely recognizable, the back being almost uniform grey. Head black in the young, sometimes with a light curved mark: dark grey in the adult, with or without a light streak behind the eye.

Distribution : India : Between Mumbai and Karwar on the west coast of India and from Chennai northwards to the mouth of of the Ganges on the East coast.

Elsewhere : Pakistan, Bangladesh, China, Myanmar, Malaysia and Thailand.

120. ***Lapemis curtus*** (Shaw 1802)
Short sea snake

1802. *Hydrus curtus* Gray *Gen. Zool.* iii. p.562 (type-loc. Unknown; London).

1943. *Lapemis curtus* Smith, *Fauna of British India*, **3** : p. 470.

Diagnosis : Head large, body short and stout. The diameter of the neck being half or more than half the greatest diameter of the body. Dorsal colour is light dark olive or greyish above whitish below with 45 to 55 narrow dark bands tapering to a point on the flanks and often confluent along the vertebral line.Head blakish in the young and grayish in the adult.

Distribution : India : West coast of Peninsular India.

Elsewhere : Coastal waters of Sri Lanka, Burma, Arabia and Iran.

121. Pelamis platurus (Linnaeus 1766)
Pelagic sea snake

1766. *Anguis platurus* Linnaeus, *Syst. Nat. ed.* 12, p. 391 (no type locality).

1943. *Pelamis platurus* Smith, *Fauna of British India*, **3** : p. 476.

Diagnosis : Head narrow and snout is elongated. Dorsal colour black or lemon yellow with black dorsal stripe. Ventrum, top and side of the head are of the same colorations. Chin is pigmented with dark. Tail is with black and white bars or vermiculate.

Distribution : India : Complete coastal line of India.

Elsewhere : Indo- Australian seas and its extends north to southern Siberia and south to Tasmania.

Family 20. VIPERIDAE

122. ***Daboia russelii*** (Shaw)

Russell's viper

1797. *Coluber russelli* Shaw, *Nat. Misc.* viii, pl. 291 (based on Russell's figure).

2003. *Daboia russelii* Das, *J. Bombay nat. Hist. Soc.*, **100** (2&3) Aug-Dec. p. 447-501.

Diagnosis : Light brown above with a bold and distinct pattern consisting of three series of large, dark oval spots.Head with two large black spots at base and a light V-shaped mark with its apex on top of snout. Lower parts yellowish white or marbled with brown.

Distribution : Throughout the Indian Subcontinent.

Elsewhere : Burma, Thailand, Indo-China, Formoss, Indo-Austrialian and Sri Lanka.

123. ***Echis carinatus*** (Schneider)

Saw–scaled viper

1801. *Pseudoboa carinata* Schneider, *Hist. Amphibiorum.* ii. p. 285 (based on Russell).

1943. *Echis carinatus* Smith, *Fauna of British India*, 3 : p. 487.

Diagnosis : Usually brown, buff, sandy or greenish above, with a series of pale black – edged middorsal spots and two to three rows of blotches laterally; a pale sinuous white line running down the back on either side. A white cross – like mark on top of the head. Underside white and speckled with brown or black.

Distribution : The whole of India except the Gangetic plains and northeastern India.

Elsewhere : Africa, Middle East and Southwestern Asia.

124. ***Hypnale hypnale*** (Merrem)

Hump-nosed pit viper

1820. *Cophias hypnale* Merrem, *Syst. Amphi.* p.155.

2003. *Hypnale hypnale* Sharma, Handbook-Indian Snakes ZSI, Kolkata.

Material examined : 1 ex., Jog falls, North Kannara. 21. iv. 92, P. D. Rane, Coll.

Diagnosis : Ground colour grey or brown, heavily powdered and mottled with brown. Dorsal pattern consists of a series of large ovate spots along each side of the mid-body and a lateral series of similar spots. Head dark brown, with dark stripes; nape with two longitudinal dark stripes. Tip of tail yellowish or reddish and belly grey, yellowish or brownish spotted with black.

Distribution : Western Ghats.

Elsewhere : Sri Lanka.

125. ***Trimeresurus malabaricus*** (Jerdon)

Malabar pit viper

1871. *Trigonocephalus (Cophias) malabaricus* Jerdon, J. A. S, Bengal xxii, p. 523(Western Ghats).

1943. *Trimeresurus malabaricus* Smith, Fauna *of British India*, **3** : p. 513.

Material examined : 1ex., Pettikere, Medikere, 23. xii. 05, S. Prabakaran, Coll.; 1ex., Kavalakadi River, Kollur range. 17. xii. 07. R. Aengals, Coll.

Diagnosis : Dorsum greenish or olive brown with a series of brown or black spots which often tend to joint to form a zigzag-like stripe; an uneven series of yellow spots along the sides. Head with a black temporal streak. Tail black and yellow and lower surfaces pale green to yellow.

Distribution : Eastern and Western Ghats.

Remarks : Endemic to Eastern Ghats and Western Ghats.

126. ***Trimeresurus gramineus*** (Shaw)
Green pit-viper

1802. *Coluber gramineus* Shaw, *Gen. Zool.* iii, p. 420, based on Russell's "Badroo Pam," Ind. Serp. i, pl. ix, p. 13.

1943. *Trimeresurus gramineus* Smith, *Fauna of British India,* **3** : p. 515.

Diagnosis : Usually bright green above, with scattered dark – brown spots; the green colour of the back and the pale colour of the ventrals tend to fuse and form a broken and uneven streak along the flanks; upper lip and chin and throat greenish; belly yellowish; tail reddish or yellowsh; mottled with dark.

Distribution : India : West Bengal, Gujarat and Peninsular India, Rare in the Western Ghats, South of Goa. Common at Castle Rock, Uttara Kannada District, Karnataka.

Remarks : Endemic to India.

SUMMARY

The present study records 126 species of reptiles under 65 genera belonging to 20 families. Each species has been provided with the diagnosis, distribution and endemic status and Remarks. Endemic reptiles in Karnataka state is represented by 2 species of turtles, 13 species of lizards and 17 species of snakes.

ACKNOWLEDGEMENTS

The authors are indebted to the Director, Zoological Survey of India (ZSI), for providing facilities to carry out this work. The Officer-in-Charge of Southern Regional Centre, Chennai and Western Regional Centre, Pune for facilities and identification of reptile specimens. Mr. S. R. Ganesh, Research Scholar, Chennai Snake Park is acknowledged for photographs.

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Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 467-493, 2013

AVES

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INTRODUCTION

The Avian constituents of Karnataka are distributed in 75 families accommodated in 536 species. As of 2012 the Indian avian inventory indicates the presence of 1301 species of which Karnataka has 41%. Out of the 57 vulnerable species of birds occurring in India 12 has been reported to occur in this state. In addition out of the 42 endemics 16 species are endemic to Karnataka. According to the forest regulations 40 species are in Schedule I, 1 species in Schedule V and the rest in schedule IV.

In this work we present a list of Avifaunal elements with indications on the endemic status, threat status and legal status. For identification we have followed www.birdsinternational.net <http://www.birdsinternational.net>. This list is the culmination point of several survey observations of tour parties for nearly a decade. Habitat loss and anthropogenic threats appear to have a telling effect on the distribution of birds in Karnataka. Involvement of local population in bird conservation appears to have gained momentum in Karnataka taking cue from Kokrebellur village folks.

SUMMARY

An inventory of the Avifauna of Karnataka consisting of 75 families accommodating 536 species presented in this work. The list is progressive and non conclusive. Status may vary from time to time.

ACKNOWLEDGEMENTS

The scientific team thanks the Director, Zoological Survey of India and Officer in Charge of SRC, Chennai for continuous encouragement and financial support. But for the active involvement of several survey parties and technical back up by Southern Regional Station fraternity, this work would not have been possible. As the first author has passed away during the final stage of documenting, this work is more of a tribute to him.

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List of birds of Karnataka

Sl. No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
1	Podicipedidae	● Little Grebe	● *Tachybaptus ruficollis* (Pallas,1764)	cr		LC	S-IV
2	Hydrobatidae	Wilson's Storm- Petrel	⌘ *Oceanites oceanicus* (Kuhl,1820)	v		LC	S-IV
3	Hydrobatidae	Swinhoe's Storm-Petrel	⌘ *Oceanodroma monorhis* (Swinhoe,1867)	*nr*		NT	S-IV
4	Phaethontidae	Yellow-billed Tropicbird	⌘ *Phaethon lepturus* (Daudin, 1802)	v		LC	S-IV
5	Fregatidae	Great Fregate Bird	⌘ *Fregata minor* (Gmelin1789)	v		LC	
6	Fregatidae	Lesser Frigate Bird	⌘ *Fregata ariel* Gray,1845	v		LC	
7	Pelecanidae	Great White Pelican	⌘ *Pelecanus onocrotalus* (Linnaeus,1758)	v		LC	
8	Pelecanidae	Spot-billed Pelican	# *Pelecanus philippensis* (Genelin,1789)	nr		VU	S-IV
9	Procellaridae	Wedge-tailed Shearwater	⌘ *Puffinus pacificus* Gmelin,1789	v		LCS	
10	Phalacrocoracidae	Indian Shag	● *Phalacrocorax fuscicollis* Stephen,1826	cr		LC	S-IV
11	Phalacrocoracidae	Great Cormorant	# *Phalacrocorax carbo* Linneus,1758	*nr*		LC	S-IV
12	Phalacrocoracidae	Little Cormorant	● *Phalacrocorax niger* (Vieillot,1817)	*cr*		LC	S-IV
13	Anhingidae	Indian darter	# *Anhinga melanogaster* (Pennant,1769)	*nr*		NT	S-IV
14	Sulidae	Masked Booby	⌘ *Sula dactylatra* (Lesson,1831)	v		LC	
15	Sulidae	Brown Booby	⌘ *Sula leucogaster* (Boddaert,1783)	v		LC	
16	Ardeidae	Grey Heron	❍ *Ardea cinerea* (Linneus,1758)	nw		LC	S-IV
17	Ardeidae	Purple Heron	❍ *Ardea purpurea* (Linneus,1766)	*nw*		LC	S-IV
18	Ardeidae	Little Green Heron	# *Butorides striatus* (Linnaeus,1758)	*nr*		LC	S-IV
19	Ardeidae	Indian Pond Heron	● *Ardeola grayii* (Sykes,1832)	*cr*		LC	S-IV
20	Ardeidae	Cattle Egret	● *Bubulcus ibis*(Linnaeus,1758)	*cr*		LC	S-IV
21	Ardeidae	Large Egret	# *Ardea alba* (Linnaeus,1758)	*nr*		LC	S-IV

Table contd.

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
22	Ardeidae	Median Egret	● *Mesophoyx intermedia* (Wagler,1827)	*cr*		LC	S-IV
23	Ardeidae	Little Egret	● *Egretta garzetta* (Linnaeus,1766)	*cr*		LC	S-IV
24	Ardeidae	Western Reef Heron	⌘ *Egretta gularis* (Bose,1792)	*v*		LC	S-IV
25	Ardeidae	Black-crowned Night Heron	● *Nycticorax nycticorax* (Linnaeus,1758)	*cr*		LC	S-IV
26	Ardeidae	Malayan Night- Heron	# *Gorsachius melanolophus* Raffles,1822	*nr*		LC	S-IV
27	Ardeidae	Chestnut Bittern	# *Ixobrychus cinnamomeus* Gmelin,1789	*nr*		LC	S-IV
28	Ardeidae	Yellow Bittern	❍ *Ixobrychus sinensis* (Gmelin,1789)	*nw*		LC	S-IV
29	Ardeidae	Black Bittern	# *Dupetor flavicollis* Latham,1790	*nr*		LC	S-IV
30	Ardeidae	Great Bittern	❍ *Botaurus stellaris* (Linnaeus,1758)	nw		LC	S-IV
31	Ciconiidae	Painted Stork	# *Mycteria leucocephala* (Pennant,1769)	*nr*		NT	S-IV
32	Ciconiidae	Asian Openbill Stork	# *Anastomus oscitans* Boddaert,1783	*nr*		LC	S-IV
33	Ciconiidae	White-necked Stork	# *Ciconia episcopus* Boddaert,1783	*nr*		LC	S-IV
34	Ciconiidae	European White Stork	❍ *Ciconia ciconia* (Linnaeus, 1758)	*nw*		LC	S-IV
35	Ciconiidae	Black Stork	❍ *Ciconia nigra* (Linnaeus, 1758)	*nw*		LC	S-IV
36	Ciconiidae	Black-necked Stork	# *Ephippiorhynchus asiaticus* Latham,1790	*nr*		NT	S-IV
37	Ciconiidae	Lesser Adjutant Stork	# *Leptoptilos javanicus* Horsfield,1821	*nr*		VU	S-IV
38	Ciconiidae	Greater Adjutant-Stork	☒ *Leptoptilos dubius* Gmelin,1789	np		EN	S-IV
39	Threskiornithidae	Glossy Ibis	*Plegadis falcinellus* Linnaeus,1766	*xr/nw*		LC	S-IV
40	Threskiornithidae	Black headed Ibis	# *Threskiornis melanocephalus* (Latham,1790)	*nr*		NT	S-IV
41	Threskiornithidae	Red naped Ibis	# *Pseudibis papillosa* Temminck,1824	*nr*		LC	S-IV
42	Threskiornithidae	Eurasian Spoonbill	# *Platalea leucorodia* Linnaeus,1758	*nr*		LC	S-I
43	Phoenicopteridae	American Flamingo	*Phoenicopterus ruber* Linnaeus,1758	*xr/nw*		LC	S-IV

Table contd.

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
44	Phoenicopteridae	Lesser Flamingo	☒ *Phoenicopterus minor* Geaffroysainthilaire,1798			NT	S-IV
45	Anatidae	Lesser Whistling-Duck	● *Dendrocygna javanica* Horsfield,1821	*cr*		LC	S-IV
46	Anatidae	Fulvus Whistling-Duck	⌘ *Dendrocygna bicolor* Vieillot,1816	v		LC	S-I
47	Anatidae	Bar-headed Goose	❍ *Anser indicus* Latham,1790	*nw*		LC	S-IV
48	Anatidae	Ruddy Shelduck	❍ *Tadorna ferruginea*(Pallas,1764)			LC	S-IV
49	Anatidae	Comb Duck	# *Sarkidiornis melanotos*(Penmnant,1763)	*nr*		LC	S-IV
50	Anatidae	Northern Pintail	⌀ *Anas acuta* Linnaeus,1758	*cw*		LC	S-IV
51	Anatidae	Eurasian Teal	❍ *Anas crecca* Linnaeus,1758	*nw*		LC	S-IV
52	Anatidae	Spot-billed Duck	● *Anas poecilorhyncha* Forster,1781	*cr*		LC	S-IV
53	Anatidae	Mallard	❍ *Anas platyrhynchos* Linnaeus,1758			LC	S-IV
54	Anatidae	Gadwall	❍ *Anas strepera* Linnaeus,1758	*nw*		LC	S-IV
55	Anatidae	Eurasian Wigeon	❍ *Anas Penelope* Linnaeus,1758	*nw*		LC	S-IV
56	Anatidae	Garganey	⌀ *Anas querquedula* Linnaeus,1758	cw		LC	S-IV
57	Anatidae	Northern Shoveller	⌀ *Anas clypeata* Linnaeus,1758	*cw*		LC	S-IV
58	Anatidae	Red-Crested Pochard	*Netta rufina* (Pallas,1773)	*nw*		LC	S-IV
59	Anatidae	Ferruginous duck	❍ *Aythya nyroca* (Giildenstadt,1770)	*nw*		NT	S-IV
60	Anatidae	Common Pochard	❍ *Aythya ferina* Linnaeus,1758	*nw*		VU	S-IV
61	Anatidae	Tufted Pochard (Duck)	❍ *Aythya fuligula* (Linnaeus,1758)	*nw*		LC	S-IV
62	Anatidae	Cotton Teal	# *Nettapus coromandelianus* Gmelin,1789	*nr*		LC	S-IV
63	Anatidae	Common shelduck	❍ *Tatorna tadorna* (Linnaeus,1758)	nw		LC	
64	Accipitridae	Black- winged Kite	● *Elanus caeruleus* Desfontaines,1789	*cr*		LC	S-I

Table contd.

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
65	Accipitridae	Jerdon's Baza	❍ *Aviceda jerdoni* (Blyth,1842)	*nw*		LC	S-I
66	Accipitridae	Black Baza	⌘ *Aviceda leuphotes* (Dumont,1820)	*v*		LC	S-I
67	Accipitridae	Crested Honey-Buzzard	■ *Pernis ptilorhynchus* Temminck,1821	*lcr*		LC	S-I
68	Accipitridae	Black Kite	● *Milvus migrans* (Boddaert,1783)	*cr*		LC	S-I
69	Accipitridae	Brahminy Kite	■ *Haliastur Indus* Boddaert,1783	*lcr*		LC	S-I
70	Accipitridae	White-bellied Sea-Eagle	# *Haliaeetus leucogaster* Gmelin,1789	*nr*		LC	S-I
71	Accipitridae	White-tailed Sea-Eagle	*Haliaeetus albicilla* (Linnaeus,1758)	Not available		NT	S-IV
72	Accipitridae	Shikra	● *Accipiter badius* Gmelin,1788	cr		LC	S-I
73	Accipitridae	Crested Goshawk	# *Accipiter trivirgatus* (Temminck,1824)	*nr*		LC	S-I
74	Accipitridae	Eurasian Sparrow-hawk	❍ *Accipiter nisus* (Temminck,1824)	*nw*		LC	S-I
75	Accipitridae	Besra Sparrow-hawk	# *Accipiter virgatus* Temminck,1822	*nr*		LC	S-I
76	Accipitridae	Long-legged Buzzard	⌘ *Buteo rufinus* (Cretzschmar,1829)	*v*		LC	S-I
77	Accipitridae	Common Buzzard	❍ *Buteo buteo* (Linnaeus,1758)	*nw*		LC	S-I
78	Accipitridae	White-eyed Buzzard	# *Butastur teesa* (Franklin,1831)	*nr*		LC	S-I
79	Accipitridae	Mountain Hawk-Eagle	# *Nisaetus nipalense* (Hodgson,1836)	nr		LC	S-I
80	Accipitridae	Changeable Hawk-Eagle	# *Nisaetus cirrhatus* (Gmelin,1788)	*nr*		LC	S-I
81	Accipitridae	Bonelli's Eagle	# *Aquila fasciata* (Vieillot,1816)	*nr*		LC	S-I
82	Accipitridae	Booted Eagle	❍ *Aquila pennata* (Gmelin,1788)	*nw*		LC	S-I
83	Accipitridae	Rufous-bellied Eagle	*Lophotriochis kienerii* (G,de Sparre,1835)	*nr*		LC	S-I
84	Accipitridae	Greater Spotted Eagle	❍ *Aquila clanga* Pallas,1811	*nw*		VU	S-I
85	Accipitridae	Tawny Eagle	# *Aquila rapax* Temminck,1824	*nr*		LC	S-I
86	Accipitridae	Steppe Eagle	⌘ *Aquila nipalensis* (Hodgson,1833)			LC	S-I
87	Accipitridae	Black Eagle	# *Ictinaetus malayensis* (Temminck,1822)	*nr*		LC	S-I

Table contd.

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
88	Accipitridae	Greater Grey-headed Fish Eagle	# *Ichthyophaga ichthyaetus* (Horsfield, 1821)	*nr*		NT	S-I
89	Accipitridae	Red-headed Vulture	# *Sarcogyps calvus* (Scopoli,1786)	*nr*		NT	S-IV
90	Accipitridae	Indian Vulture	# *Gyps indicus* (Scopoli,1786)	*nr*		CR	S-IV
91	Accipitridae	White- rumped Vulture	# *Gyps bengalensis* (Gmelin,1788)	*nr*		CR	S-IV
92	Accipitridae	Griffon vulture	⌘ *Gyps fulvus* (Hablizl,1783)	*v*		LC	S-IV
93	Accipitridae	Egyptian Vulture	● *Neophron percnopterus* (Linnaeus,1758)	*cr*		EN	S-IV
94	Accipitridae	Pallid Harrier	❍ *Circus macrourus* Gmelin,1770	*nw*		NT	S-I
95	Accipitridae	Montagu's Harrier	❍ *Circus pygargus* (Linnaeus,1758)	*nw*		LC	S-I
96	Accipitridae	Pied Harrier	❍ *Circus melanoleucos* (Pennant,1769)	*nw*		LC	S-I
97	Accipitridae	Western Marsh Harrier	❍ *Circus aeruginosus* (Linnaeus,1758)	nw		LC	S-I
98	Accipitridae	Short-toed Snake Eagle	# *Circaetus gallicus* (Gmelin,1788)	*nr*		LC	S-I
99	Accipitridae	Crested Serpent Eagle	# *Spilornis cheela* Latham,1790	*nr*		LC	S-I
100	Accipitridae	Cinereous Vulture	*Aegypius monachus* (Linnaeus,1766)			NT	
101	Accipitridae	Northern Goshawk	*Accipiter gentilis* (Linnaeus,1758)				
102	Accipitridae	Pallas Fish Eagle	⌘ *Haliaeetus leucoryphus* (Pallas,1771)	v		VU	
103	Accipitridae	Indian Spotted Eagle	⌘ *Aquila hastate* (Lesson,1834)	v		VU	
104	Accipitridae	Hen Harrier	❍ *Circus cyaneus* (Linnaeus,1766)	nw		LC	
105	Accipitridae	Oriental Hobby	⌘ *Falco severus* Horsfield,1821	v		LC	
106	Pandionidae	Osprey	❍ *Pandion haliaetus* (Linnaeus,1758)	*nw*		LC	S-I
107	Falconidae	Peregrine Falcon	# *Falco peregrines* Tunstall,1771	*nr*		LC	S-I
108	Falconidae	Red-neaced Falcon	# *Falco chicquera* Daudin,1800	*nr*		LC	S-I
109	Falconidae	Common Kestrel	⌀ *Falco tinnunculus* Linnaeus,1758	*cw*		LC	S-IV

Table contd.

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
110	Falconidae	Lesser Kestrel	☒ *Falco naumanni* Fleischer,1818	*np*		VU	S-IV
111	Falconidae	Amur Falcon	☒ *Falco amurensis* Radde,1863	*np*		LC	S-IV
112	Falconidae	Eurasian Hobby	❍ *Falco subbuteo* Linnaeus,1758	*nw*		LC	S-IV
113	Falconidae	Laggar falcon	# *Falco jugger* Gray,1834	*nr*		NT	S-IV
114	Phasianidae	Common Quail	❍ *Coturnix coturnix* (Linnaeus,1758)	nw		LC	S-IV
115	Phasianidae	Rain Quail	☒ *Coturnix coromandelica* (Gmelin,1789)	*np*		LC	S-IV
116	Phasianidae	Blue-breasted Quail	# *Coturnix chinensis* Linnaeus,1766)	*nr*		LC	S-IV
117	Phasianidae	Painted Francolin	● *Francolinus pictus* Jardine &Selby,1828	cr		LC	
118	Phasianidae	Grey Francolin	● *Francolinus pondicerianus* (Gmelin,1789)	*cr*		LC	S-IV
119	Phasianidae	Jungle Bush-Quail	# *Perdicula asaitica* Latham,1790	*nr*		LC	S-IV
120	Phasianidae	Rock Bush-Quail	# *Perdicula argoondah* Sykes,1832	*nr*		LC	S-IV
121	Phasianidae	Painted Bush-Quail	# *Perdicula erythrorhyncha* Sykes,1832	*nr*		LC	S-IV
122	Phasianidae	Red Spurfowl	■ *Galloperdix spadicea* (Gmelin,1789)	*lcr*		LC	S-IV
123	Phasianidae	Painted Spurfowl	# *Galloperdix lunulata* (Valenciennes,1813)	*nr*		LC	S-IV
124	Phasianidae	Grey Junglefowl	■ *Gallus sonneratii* (Temminck,1824)	*lcr*		LC	S-IV
125	Phasianidae	Indian Peafowl	■ *Pavo cristatus* (Linnaeus,1758)	*lcr*		LC	S-IV
126	Turnicidae	Yellow-legged Buttonquail	# *Turnix tanki* (Blyth,1843)	*nr*		LC	S-IV
127	Turnicidae	Small Buttonquail	# *Turnix sylvaticus* (Desfontaines,1789)	*nr*		LC	S-IV
128	Turnicidae	Common Bustard	#*T urnix suscitator* (Gmelin,1789)	*nr*		LC	S-IV
129	Gruidae	Demoiselle Crane	❍ *Anthropoides virgo* (Linnaeus,1758)	*nw*		LC	S-IV
130	Rallidae	Slaty-breasted Rail	# *Gallirallus striatus* (Linnaeus,1766)	*nr*		LC	S-IV
131	Rallidae	Slaty-legged Crake	# *Rallina eurizonoides* Lafresnaye,1845	*nr*		LC	S-IV

Table contd.

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
132	Rallidae	Ruddy-breasted Crake	# *Porzana fusca* Linnaeus,1766	*nr*		LC	S-IV
133	Rallidae	Water Rail	⌘ *Rallus aquaticus* Linnaeus,1758			LC	S-IV
134	Rallidae	Brown Crake	# *Amaurornis akool* (Sykes,1732)	*nr*		LC	S-IV
135	Rallidae	White-breasted Waterhen	● *Amaurornis phoenicurus* Pennant,1769	*cr*		LC	S-IV
136	Rallidae	Watercock	# *Gallicrex cinerea* (Gmelin,1789)	*nr*		LC	S-IV
137	Rallidae	Common Moorhen	● *Gallinula chloropus* Linnaeus,1758	*cr*		LC	S-IV
138	Rallidae	Purple Moorhen	● *Porphyrio porphyrio* (Linnaeus,1758)	*cr*		LC	S-IV
139	Rallidae	Eurasian Coot	● *Fulica atra* Linnaeus,1758	*cr*		LC	S-IV
140	Rallidae	Baillon's Crake	❍ *Porzana pusilla* (Pallas,1776)	nw		LC	
141	Rallidae	Spotted Crake	⌘ *Porzana porzana* Linnaeus,1766	v		LC	
142	Rallidae	Little Crake	*Porzana parva* (Scopoli,1769)			LC	
143	Otidae	Lesser Floricon	# *Sypheotides indicus* (Miller,1782)	nr		EN	
144	Otididae	Great Indian Bustard	# *Ardeotis nigriceps* (Vigors,1831)	*nr*		CR	S-IV
145	Jacanidae	Pheasant-tailed Jacana	■ *Hydrophasianus chirurgus* (Scopoli,1786)	*lcr*		LC	S-IV
146	Jacanidae	Bronze-winged Jacana	# *Metopidius indicus* (Latham,1790)	*nr*		LC	S-IV
147	Rostratulidae	Greater Painted-Snipe	# *Rostratula benghalensis* (Linnaeus,1758)	*nr*		LC	S-IV
148	Haematopodidae	Eurasian Oystercatcher	❍ *Haematopus ostralegus* Linnaeus,1758	*nw*		LC	S-IV
149	Charadriidae	Pacific Golden-Plover	❍ *Pluvialis fulva* (Gmelin,1758)	nw		LC	S-IV
150	Charadriidae	Grey Plover	❍ *Pluvialis squatarola* (Linnaeus,1758)	*nw*		LC	S-IV
151	Charadriidae	Greater Sand Plover	❍ *Charadrius leschenaultia* (Lesson,1826)	*nw*		LC	S-IV
152	Charadriidae	Common Ringed Plover	❍ *Charadrius hiaticula* (Linnaeus,1758)	*nw*		LC	S-IV
153	Charadriidae	Little Ringed Plover	# *Charadrius dubius* (Scopoli,1786)	*nr*		LC	S-IV

Table contd.

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
154	Charadriidae	Kentish Plover	❍ *Charadrius alexandrines* Linnaeus,1758	*nw*		LC	S-IV
155	Charadriidae	Lesser Sand Plover	❍ *Charadrius mongolus* Pallas,1776	*nw*		LC	S-IV
156	Charadriidae	Red-wattled Lapwing	● *Vanellus indicus* (Boddaert,1783)	*cr*		LC	S-IV
157	Charadriidae	Yellow-wattled Lapwing	● *Vanellus malabaricus* (Boddaert,1783)	*cr*		LC	S-IV
158	Charadriidae	Grey-headed Lawpwing	*Vanellus cinereus* Blyth,1842			LC	
159	Charadriidae	White-tailed Lapwing	⌘ *Vanellus leucurus* (Lichtenstein,1823)	v		LC	
160	Scolopacidae	Whimbrel	❍ *Numenius phaeopus* (Linnaeus,1758)	*nw*		NT	S-IV
161	Scolopacidae	Eurasian Curlew	❍ *Numenius arquata* (Linnaeus,1758)	*nw*		NT	S-IV
162	Scolopacidae	Black-tailed Godwit	❍ *Limosa limosa* (Linnaeus,1758)	*nw*		LC	S-IV
163	Scolopacidae	Bar-tailed Godwit	❍ *Limosa lapponica* (Linnaeus,1758)			LC	S-IV
164	Scolopacidae	Spotted Redshank	❍ *Tringa erythropus* (Pallas,1764)	*nw*		LC	S-IV
165	Scolopacidae	Common Redshank	❍ *Tringa tetanus* (Linnaeus,1758)	*nw*		LC	S-IV
166	Scolopacidae	Marsh Sandpiper	✡ Tringa stagnatilis (Beehstein,1803)	*lcw*		LC	S-IV
167	Scolopacidae	Spotted Greenshank	#*Tringa guttifer* (Nordmann,1835)			EN	S-IV
168	Scolopacidae	Common Greenshank	⌀ Tringa nebularia (Gunnerus,1769)	*cw*		LC	S-IV
169	Scolopacidae	Green Sandpiper	⌀ Tringa ochropus Linnaeus,1758	cw		LC	S-IV
170	Scolopacidae	Wood Sandpiper	⌀ Tringa glareola Linnaeus,1758	cw		LC	S-IV
171	Scolopacidae	Terek Sandpiper	❍ *Xenus cinereus* (Giildenstadt,1775)	*nw*		LC	S-IV
172	Scolopacidae	Common Sandpiper	⌀ Actitis hypoleucos (Linnaeus,1758)	cw		LC	S-IV
173	Scolopacidae	Ruddy Turnstone	❍ *Arenaria interpres* (Linnaeus,1758)	*nw*		LC	S-IV
174	Scolopacidae	Asian Dowitcher	❍ *Limnodromus semipalmatus* (Blyth,1848)			NT	S-IV
175	Scolopacidae	Great Snipe	*Gallinago media* (Latham,1787)			NT	

Table contd.

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
176	Scolopacidae	Pintailed Snipe	ø *Gallinago stenura* (Bonaparte,1831)	cw		LC	S-IV
177	Scolopacidae	Swinhoe's Snipe	⌘ *Gallinago megala* (Swinhoe,1861)	*v*		LC	S-IV
178	Scolopacidae	Common Snipe	ø *Gallinago gallinago* (Linnaeus,1758)	*cw*		LC	S-IV
179	Scolopacidae	Wood Snipe	❍ *Gallinago nemoricola* Hodgson,1836	*nw*		VU	S-IV
180	Scolopacidae	Jack Snipe	❍ *Lymnocryptes minimus* (Brunnich,1764)	*nw*		LC	S-IV
181	Scolopacidae	Eurasian Woodcock	❍ *Scolopax rusticola* Linnaeus,1758	*nw*		LC	S-IV
182	Scolopacidae	Red Knot	❍ *Calidris canutus* (Linnaeus,1758)			LC	S-IV
183	Scolopacidae	Great Knot	⌘ *Calidris tenuirostris*(Horsfield,1821	*v*		VU	S-IV
184	Scolopacidae	Sanderling	❍ *Calidris alba* Pallas,1776	*nw*		LC	S-IV
185	Scolopacidae	Little Stint	ø *Calidris minuta* Leisler,1812	cw		LC	S-IV
186	Scolopacidae	Temminck's Stint	❍ *Calidris temminckii* Leisler,1812	nw		LC	S-IV
187	Scolopacidae	Long-toed Stint	❍ *Calidris subminuta* Midderdorff,1853			LC	S-IV
188	Scolopacidae	Dunlin	❍ *Calidris alpine* (Linnaeus,1758)	*nw*		LC	S-IV
189	Scolopacidae	Curlew Sandpiper	❍ *Calidris ferruginea* (Pontoppidan,1763)	*nw*		LC	S-IV
190	Scolopacidae	Spoonbilled Sandpiper	❍ *Euryno rhynchus* (Linnaeus,1758)			CR	S-IV
191	Scolopacidae	Red-necked Stint	❍ *Calidris ruficollis* (Pallas,1776)			LC	S-IV
192	Scolopacidae	Broad-billed Sandpiper	❍ *Limicola falcinellus* (Pontoppidan,1763)	*nw*		LC	S-IV
193	Scolopacidae	Ruff	❍ *Philomachus pugnax* (Linnaeus,1758)	*nw*		LC	S-IV
194	Scolopacidae	Red-necked Phalarope	⌘ *Phalaropus lobatus* (Linnaeus,1758)	*v*		LC	S-IV
195	Recurvirostridae	Black-winged Stilt	# *Himantopus himantopus* (Linnaeus,1758)	*nr*		LC	S-IV
196	Recurvirostridae	Pied Avocet	⌘ *Recurvirostra avosetta* Linnaeus,1758	*v*		LC	S-IV
197	Dromadidae	Crab-Plover	❍ *Dromas ardeola* Paykull,1805	*nw*		LC	S-IV

Table contd.

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
198	Burhinidae	Eurasian Stone-Curlew	# *Burhinus oedicnemus* (Linnaeus,1758)	*nr*		LC	S-IV
199	Burhinidae	Great Stone-Plover	# *Esacus recurvirostris* (Cuvier,1829)	*nr*		LC	S-IV
200	Glareolidae	Indian Courser	# *Cursorius coromandelicus* (Gmelin,1789)	*nr*		LC	S-IV
201	Glareolidae	Oriental Pratincole	❍ *Glareola maldivarum* Forster,1795			LC	S-IV
202	Glareolidae	Small Pratincole	# *Glareola lactea* Temminck,1820	*nr*		LC	S-IV
203	Stercorariidae	Brown skua	*Stercorarius antarcticus* Brooke,1978			LC	S-IV
204	Stercorariidae	South Polar Skua	*Stercorarius maccormicki* (Saunders,1893)			LC	
205	Stercorariidae	Parasitic Jaeger	☒ *Stercorarius parasiticus* (Linnaeus,1758)	np		LC	
206	Laridae	Heuglin's Gull	❍ *Larus heuglini* Bree,1876	*nw*		LC	S-IV
207	Laridae	Caspian Gull	❍ *Larus cachinnans*(Pallas,1811	*nw*		LC	S-IV
208	Laridae	Pallas's Gull	❍ *Ichthyactus ichthyaetus* (Pallas,1773)	*nw*		LC	S-IV
209	Laridae	Brown-headed Gull	❍ *Chroicocephalus brunnicephalus* (Jerdon,1840)	*nw*		LC	S-IV
210	Laridae	Black-headed Gull	❍ *Chroicocephalus ridibundus* (Linnaeus,1766)	*nw*		LC	S-IV
211	Laridae	Slender-billed Gull	❍ *Chroicocephalus genei* (Breme,1839)	*nw*		LC	S-IV
212	Sternidae	Whiskered Tern	❍ *Chlidonias hybridus* (Pallas,1811)	*nw*		LC	S-IV
213	Sternidae	White-winged Tern	⌘ *Chlidonias leucopterus* (Temminck,1815)	*v*		LC	S-IV
214	Sternidae	Black Tern	⌘ *Chlidonias niger* (Linnaeus,1758)			LC	S-IV
215	Sternidae	Brown Noddy	⌘ *Anous stolidus* (Linnaeus,1758)			LC	S-IV
216	Sternidae	Gullbilled Tern	❍ *Gelochelidon nilotica* (Gmelin,1789)	*nw*		LC	S-IV
217	Sternidae	Caspian Tern	❍ *Hydroprogne caspia* (Pallas,1770)	*nw*		LC	S-IV
218	Sternidae	Common Tern	☒ *Sterna hirundo* Linnaeus,1758	*np*		LC	S-IV
219	Sternidae	Roseate Tern	☒ *Sterna dougallii* Montagu,1813	np		LC	S-IV

Table contd.

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
220	Sternidae	Black-bellied Tern	# *Sterna acuticauda* Gray,1832	*nr*		EN	S-IV
221	Sternidae	Bridled Tern	⌘ *Onychoprion anaethetus* (Scopoli,1786)	*v*		LC	S-IV
222	Sternidae	Little Tern	❍ *Sternula albifrons* Pallas,1764	*nw*		LC	S-IV
223	Sternidae	Greater Crested Tern	❍ *Thalasseus bergii* (Lichtenstein,1823)	*nw*		LC	S-IV
224	Sternidae	Lesser Crested Tern	❍ *Thalasseus bengalensis* (Lesson,1831)	*nw*		LC	S-IV
225	Sternidae	Sooty Tern	⌘ *Onychoprion fuscatus* (Linnaeus,1766)			LC	S-IV
226	Sternidae	Sandwich Tern	❍ *Thalasseus sandvicensis* (Latham,1787)	*nw*		LC	S-IV
227	Sternidae	River Tern	# *Sterna aurantia* Gray,1831	*nr*		NT	S-IV
228	Sternidae	Saunders's Tern	# *Sternula saundersi* (Hume,1877)			LC	S-IV
229	Sternidae	White-cheeked Tern	⌘ *Sterna repressa* Hartert,1916			LC	S-IV
230	Rynchopidae	Indian Skimmer	# *Rynchops albicollis* Swainson,1838	*nr*		VU	S-IV
231	Pteroclididae	Black-bellied Sandgrouse	*Pterocles orientalis* (Linnaeus,1758)			LC	
232	Pteroclididae	Chestnut-bellied Sandgrouse	# *Pterocles exustus* Temminck,1825	*nr*		LC	S-IV
233	Pteroclididae	Painted Sandgrouse	# *Pterocles indicus* (Gmelin,1789)	*nr*		LC	S-IV
234	Columbidae	Pompadour Green-Pigeon	# *Treron pompadora* (Gmelin,1789)	*nr*		LC	S-IV
235	Columbidae	Orange-breasted Green-Pigeon	# *Treron bicincta* (Jerdon,1840)	*nr*		LC	S-IV
236	Columbidae	Yellow-footed Green-Pigeon	# *Treron phoenicoptera* (Latham,1740)	*nr*		LC	S-IV
237	Columbidae	Green Imperial-Pigeon	# *Ducula aenea* (Linnaeus,1766)	*nr*		LC	S-IV
238	Columbidae	Mountain Imperial-Pigeon	# *Ducula badia* (Raffles,1822)	*nr*		LC	S-IV
239	Columbidae	Rock Dove	● *Columba livia* Gmelin,1789	*cr*		LC	S-IV
240	Columbidae	Nilgiri Wood-Pigeon	# *Columba elphinstonii* (Skyes,1832)	*nr*	E	VU	S-IV

Table contd.

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
241	Columbidae	Oriental Turtle-Dove	# *Streptopelia orientalis* (Latham,1790)	*nr*		LC	S-IV
242	Columbidae	Red Collared-Dove	# *Streptopelia tranquebarica* (Hermann,1804)	*nr*		LC	S-IV
243	Columbidae	Eurasian Collared-Dove	● *Streptopelia decaocto* (Frivaldszky,1838)	*cr*		LC	S-IV
244	Columbidae	Spotted Dove	● *Spilopelia chinensis* (Scopoli,1768)	*cr*		LC	S-IV
245	Columbidae	Laughing Dove	● *Spilopelia senegalensis* (Linnaeus,1766)	*cr*		LC	S-IV
246	Columbidae	Common Emerald Dove	# *Chalcophaps indica* (Linnaeus,1758)	*nr*		LC	S-IV
247	Psittaculidae	Alexandrine Parakeet	# *Psittacula eupatria* (Linnaeus,1766)	*nr*		LC	S-IV
248	Psittaculidae	Rose-ringed Parakeet	● *Psittacula krameri* (Scopoli,1769)	*cr*		LC	S-IV
249	Psittaculidae	Plum-headed Parakeet	# *Psittacula cyanocephala* (Linnaeus,1766)	*nr*		LC	S-IV
250	Psittaculidae	Blue-winged Parakeet	# *Psittacula columboides* (Vigors,1830)	*nr*	E	LC	S-IV
251	Psittaculidae	Vernal Hanging-Parrot	# *Loriculus vernalis* Sparmann,1787	*nr*		LC	S-IV
252	Cuculidae	Red-winged Crested Cuckoo	*Clamator coromandus* Linnaeus,1766	*np*		LC	S-IV
253	Cuculidae	Pied Crested Cuckoo	# *Clamator jacobinus* Boddaert,1783	nr		LC	S-IV
254	Cuculidae	Large Hawk-Cuckoo	⌘ *Hierococcyx sparverioides* Vigors,1832	*v*		LC	S-IV
255	Cuculidae	Brainfever Bird	# *Hierococcyx varius* (Vahl,1797)	*nr*		LC	S-IV
256	Cuculidae	Indian Cuckoo	❍ *Cuculus micropterus* Gould,1837	*nw*		LC	S-IV
257	Cuculidae	Common Cuckoo	☒ *Cuculus canorus* Linnaeus,1758	*np*		LC	S-IV
258	Cuculidae	Lesser Cuckoo	⌘ *Cuculus poliocephalus* Latham,1790	*v*		LC	S-IV
259	Cuculidae	Banded Bay Cuckoo	# *Cacomantis sonneratii* Latham,1790	*nr*		LC	S-IV
260	Cuculidae	Plaintive cuckoo	*Cacomantis merulinus* (Scopoli,1786)			LC	
261	Cuculidae	Indian Plaintive Cuckoo	# *Cacomantis passerines* Vahl,1797)	*nr*		LC	S-IV
262	Cuculidae	Asian Drongo Cuckoo	# *Surniculus lugubris* (Horsfield,1821)	*nr*		LC	S-IV

Table contd.

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
263	Cuculidae	Asian Koel	● *Eudynamys scolopaceus* (Linnaeus,1758)	*cr*		LC	S-IV
264	Cuculidae	Blue faced Malkoha	# *Phaenicophaeus viridirostris* (Jerdon,1840)	*nr*		LC	S-IV
265	Cuculidae	Sirkeer Malkoha	# *Phaenicophaeus leschanaultii* (Lesson,1830)	*nr*		LC	S-IV
266	Cuculidae	Greater Coucal	● *Centropus sinensis* (Stephens,1815)	*cr*		LC	S-IV
267	Cuculidae	Lesser Coucal	# *Centropus bengalensis* (Gmelin,1788)	*nr*		LC	S-IV
268	Tytonidae	Barn Owl	# *Tyto alba* (Scopoli,1769)	*nr*		LC	S-IV
269	Tytonidae	African Grass Owl	# *Tyto capensis* (Smith,1834)	*nr*		LC	S-IV
270	Tytonidae	Oriental Bay-Owl	# *Phodilus badius* (Horsfield,1821)	*nr*		LC	S-IV
271	Strigidae	Oriental Scops Owl	# *Otus sunia* Hodgson,1836	*nr*		LC	S-IV
272	Strigidae	Indian Scops-Owl	# *Otus bakkamoena* Pennant,1769	*nr*		LC	S-IV
273	Strigidae	Eurasian Eagle-Owl	# *Bubo bubo* (Linnaeus,1758)	*nr*		LC	S-IV
274	Strigidae	Forest Eagle-Owl	# *Bubo nipalensis* Hodgson,1836	*nr*		LC	S-IV
275	Strigidae	Dusky Eagle-Owl	# *Bubo coromandus* (Latham,1790)	*nr*		LC	S-IV
276	Strigidae	Brown Fish-Owl	# *Bubo zeylonensis* (Gmelin,1788)	*nr*		LC	S-IV
277	Strigidae	Jungle Owlet	# *Glaucidium radiatum* (Tickell,1833)	*nr*		LC	S-IV
278	Strigidae	Brown Hawk-Owl	# *Ninox scutulata* Raffles,1822	*nr*		LC	S-IV
279	Strigidae	Spotted Owlet	● *Athene brama* (Temminck,1821)	*cr*		LC	S-IV
280	Strigidae	Mottled Wood-Owl	# *Strix ocellata* (Lesson,1839)	*nr*		LC	S-IV
281	Strigidae	Brown Wood-Owl	# *Strix leptogrammica* Temminck,1831	*nr*		LC	S-IV
282	Strigidae	Long-eared Owl	⌘ *Asio otus* (Linnaeus,1758)			LC	S-IV
283	Strigidae	Short-eared Owl	❍ *Asio flammeus* (Pontoppidan,1763)	*nw*		LC	S-IV
284	Podargidae	Srilanka Frogmouth	# *Batrachostomus moniliger* Blyth,1849	*nr*		LC	S-I

Table contd.

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
285	Caprimulgidae	Great-eared Nightjar	# *Eurostopodus macrotis* (Vigors,1831)			LC	S-IV
286	Caprimulgidae	Indian Jungle Nightjar	■ *Caprimulgus indicus* Latham,1790	*lcr*		LC	S-IV
287	Caprimulgidae	Syke's Nightjar	*Caprimulgus mahrattensis* (Sykes,1832)			LC	
288	Caprimulgidae	European Nightjar	⌘ *Caprimulgus europaeus Linnaeus*,1958)			LC	S-VI
289	Caprimulgidae	Jerdon's Nightjar	# *Caprimulgus atripennis* Jerdon,1845	*nr*		LC	S-IV
290	Caprimulgidae	Common Indian Nightjar	# *Caprimulgus asiaticuss* Latham,1790	*nr*		LC	S-VI
291	Caprimulgidae	Savanna Nightjar	# *Caprimulgus affinis* (Horsfield,1821)	*nr*		LC	S-VI
292	Apodidae	Indian Edible-nest Swiftlet	# *Aerodramus unicolor* (Jerdon,1840)	*nr*		LC	S-IV
293	Apodidae	Brown-backed Needletail-Swift	# *Hirundapus giganteus* (Temminck,1825)	*nr*		LC	S-IV
294	Apodidae	White-rumped Needletail-Swift	# *Zoonavena sylvatica* (Tickell,1846)	*nr*		LC	S-IV
295	Apodidae	Alpine Swift	# *Tachymarptis melba* (Linnaeus,1758)	*nr*		LC	S-IV
296	Apodidae	Pacific Swift	⌘ *Apus pacificus* (Latham,1802)	*v*		LC	S-IV
297	Apodidae	Little Swift	● *Apus affinis* (Gray,1830)	*cr*		LC	S-IV
298	Apodidae	Asian Palm-Swift	# *Cypsiurus balasiensis* Gray,1830	*nr*		LC	S-IV
299	Hemiprocnidae	Crested Tree Swift	# *Hemiprocne coronata* (Tickell,1838)	*nr*		LC	S-IV
300	Trogonidae	Malabar Trogon	# *Harpactes fasciatus* (Pennant,1769)	*nr*		LC	S-IV
301	Alcedinidae	Lesser Pied Kingfisher	● *Ceryle rudis* (Linnaeus,1758)	*cr*		LC	S-IV
302	Alcedinidae	Small Blue Kingfisher	● *Alcedo atthis* (Linnaeus,1758)	*cr*		LC	S-IV
303	Alcedinidae	Blue-eared Kingfisher	# *Alcedo meninting* (Horsfield,1821)	*nr*		LC	S-IV
304	Alcedinidae	Oriental Dwarf Kingfisher	⌘ *Ceyx erithacua* (Linnaeus,1758)	*v*		LC	S-IV
305	Halcyonidae	Stork-billed Kingfisher	# *Pelargopsis capensis* (Linnaeus,1766)	*nr*		LC	S-IV

Table contd.

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
306	Halcyonidae	White-breasted Kingfisher	● *Halcyon smyrnensis* (Linnaeus,1758)	*cr*		LC	S-IV
307	Halcyonidae	Black-capped Kingfisher	# *Halcyon pileata* (Boddaert,1783)	*nr*		LC	S-IV
308	Halcyonidae	Collard Kingfisher	# *Todiramphus chloris* (Boddaert,1783)	nr		LC	
309	Meropidae	Blue-bearded Bee-eater	# *Nyctyornis athertoni* (Jardine &Selbee,1830)	*nr*		LC	S-IV
310	Meropidae	Chestnut-headed Bee-eater	■ *Merops leschenaultia* (Vieillot,1817)	*lcr*		LC	S-IV
311	Meropidae	European Bee-eater	⌘ *Merops apiaster* Linnaeus,1758			LC	S-IV
312	Meropidae	Blue-cheeked Bee-eater	⌘ *Merops persicus* (Pallas,1773	v		LC	
313	Meropidae	Blue-tailed Bee-eater	❍ *Merops philippinus* Linnaeus,1766)	nw		LC	S-IV
314	Meropidae	Small Bee-eater	● *Merops orientalis* Latham,1802	*cr*		LC	S-IV
315	Coraciidae	Indian Roller	● *Coracias benghalensis* (Linnaeus,1758)	*cr*		LC	S-IV
316	Coracidae	European Roller	⌘ *Coracius garrulous* Linnaeus,1758	v		NT	
317	Coraciidae	Oriental Dollar bird	# *Eurystomus orientalis* Linnaeus,1766	*nr*		LC	S-IV
318	Upupidae	Common Hoopoe	# *Upupa epops* Linnaeus,1758	*nr*		LC	S-IV
319	Bucerotidae	Malabar Grey Hornbill	# *Ocyceros griseus* (Latham,1790)	*nr*	E	LC	S-I
320	Bucerotidae	Indian Grey Hornbill	# *Ocyceros birostris* (Scopoli,1786)	*nr*		LC	S-I
321	Bucerotidae	Malabar Pied Hornbill	# *Anthracoceros coronatus* (Boddaert,1783)	*nr*		NT	S-I
322	Bucerotidae	Great Pied Hornbill	# *Buceros bicornis* Linnaeus,1758	*nr*		NT	S-I
323	Megalaimidae	Brown-haeded Barbet	■ *Megalaima zeylanica* Gmelin,1788	*lcr*		LC	S-IV
324	Megalaimidae	White-cheecked Barbet	● *Megalaima viridis* (Boddaert,1783)	*cr*		LC	S-IV
325	Megalaimidae	Crimson-throated Barbet	*Megalaima rubricapillus* Gmelin,1788	*lcr*		LC	S-IV
326	Megalaimidae	Coppersmith Barbet	● *Megalaima haemacephala* Statius muller,1776	*cr*		LC	S-IV
327	Picidae	Eurasian Wryneck	⌘ *Jynx torquilla* Linnaeus,1758	*v*		LC	S-IV

Table contd.

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
328	Picidae	Speckled Piculet	# *Picumnus innominatus* Burfon,1836	nr		LC	S-IV
329	Picidae	Rufous Woodpecker	# *Micropternus brachyurus* Vieillot,1818	*nr*		LC	S-IV
330	Picidae	Streak throated Woodpecker	# *Picus xanthopygaeus* Gray,1847	*nr*		LC	S-IV
331	Picidae	Small Yellow-naped Woodpecker	# *Picus chlorolophus* Vieillot,1818	*nr*		LC	S-IV
332	Picidae	Himalayan Golden-backed Woodpecker	# *Dinopium shorii* Vigors,1832			LC	S-IV
333	Picidae	Lesser Golden-backed Woodpecker	*Dinopium benghalense* Linnaeus,1758	*lcr*		LC	S-IV
334	Picidae	Common Golden-backed Woodpecker	# *Dinopium javanense* Ljungh,1797	*nr*		LC	S-IV
335	Picidae	Great Black Woodpecker	# *Dryocopus javensis* Horsfield,1821	*nr*		LC	S-IV
336	Picidae	Yellow-fronted Pied Woodpecker	# *Dendrocopos mahrattensis* (Latham,1802)	*nr*		LC	S-IV
337	Picidae	Brown-capped Pygmy Woodpecker	# *Dendrocopos nanus* Vigors,1832	*nr*		LC	S-IV
338	Picidae	Heart-spotted Woodpecker	# *Hemicircus canente* (Lesson,1830)	*nr*		LC	S-IV
339	Picidae	Black-shouldered Woodpecker	# *Chrysocolaptes festivus* Boddaert,1783	*nr*		LC	S-IV
340	Picidae	Greater Golden-backed Woodpecker	# *Chrysocolaptes lucidus* (Scopoli,1786)	*nr*		LC	S-IV
341	Pittidae	Indian pitta	❍ *Pitta brachyuran* (Linnaeus,1766)	*nw*		LC	S-IV
342	Alaudidae	Singing Bush-Lark	■ *Mirafra cantillans* (Blyth,1844)	*lcr*		LC	S-IV

Table contd.

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
343	Alaudidae	Red-winged Bush-Lark	# *Mirafra erythroptera* Blyth,1845	*nr*		LC	S-IV
344	Alaudidae	Jerdon's Bush-Lark	# *Mirafra affinis* Blyth,1845	*nr*		LC	S-IV
345	Alaudidae	Ashy-crowned Sparrow-Lark	# *Eremopterix griseus* (Scopoli,1786)	*nr*		LC	S-IV
346	Alaudidae	Rufous-tailed Finch-Lark	# *Ammomanes phoenicura* (Franklin,1831)	*nr*		LC	S-IV
347	Alaudidae	Greater Short-toed Lark	❍ *Calandrella brachydactyla* (Leisler,1814)	*nw*		LC	S-IV
348	Alaudidae	Sykes's Crested Lark	# *Galerida deva* (Sykes,1832)	*nr*		LC	S-IV
349	Alaudidae	Malabar Crested Lark	# *Galerida malabarica* (Scopoli,1786)	*nr*		LC	S-IV
350	Alaudidae	Eastern Skylark	● *Alauda gulgula* Franklin,1831	*cr*		LC	S-IV
351	Hirundinidae	Sand Martin	⌘ *Riparia riparia* (Linnaeus,1758)	*v*		LC	S-IV
352	Hirundinidae	Plain Martin	⌘ *Riparia paludicola* (Vieillot,1817)	v		LC	
353	Hirundinidae	Eurasian Crag Martin	❍ *Ptyonopronge rupestris* (Scopoli,1786)	*nw*		LC	S-IV
354	Hirundinidae	Dusky Crag Martin	# *Ptyonopronge concolor* (Sykes,1832)	*nr*		LC	S-IV
355	Hirundinidae	Barn Swallow	ø *Hirundo rustica* Linnaeus,1758	cw		LC	S-IV
356	Hirundinidae	Hill Swallow	# *Hirundo tahitica* Gmelin,1789	*nr*		LC	S-IV
357	Hirundinidae	Wire-tailed Swallow	■ *Hirundo smithii* Leach,1818	*lcr*		LC	S-IV
358	Hirundinidae	Streak-throated Swallow	# *Petrochelidon fluvicola* Blyth,1855	*nr*		LC	S-IV
359	Hirundinidae	Red-rumped Swallow	● *Cecropis daurica* (Laxmann,1769)	*cr*		LC	S-IV
360	Hirundinidae	Northern House-Martin	❍ *Delichon urbicum* (Linnaeus,1758)	*nw*		LC	S-IV
361	Motacillidae	Blyth's Pipit	❍ *Anthus godlewskii* Taczanowski,1876	*nw*		LC	S-IV
362	Motacillidae	Eurasian Tree Pipit	❍ *Anthus trivialis* (Linnaeus,1758)	*nw*		LC	S-IV
363	Motacillidae	Oriental Tree Pipit	❍ *Anthus hodgsoni* Richmond,1907	nw		LC	S-IV
364	Motacillidae	Richard's Pipit	❍ *Anthus richardi* Vieillot,1818	*nw*		LC	S-IV

Table contd.

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
365	Motacillidae	Paddyfield Pipit	■ *Anthus rufulus* Vieilltt, 1818	*lcr*		LC	S-IV
366	Motacillidae	Tawny Pipit	❍ *Anthus campestris* (Linnaeus,1758)	*nw*		LC	S-IV
367	Motacillidae	Brown Rock Pipit	# *Anthus similis* (Jerdon, 1840)	*nr*		LC	S-IV
368	Motacillidae	Nilgiri Pipit	# *Anthus nilghiriensis* Sharpe,1885	*nr*	E	VU	S-IV
369	Motacillidae	Forest Wagtail	❍ *Dendronanthus indicus* (Gmelin,1789)	*nw*		LC	S-IV
370	Motacillidae	Yellow Wagtail	⌀ *Motacilla flava* Linnaeus 1758	cw		LC	S-IV
371	Motacillidae	Citrine Wagtail	❍ *Motacilla citreola* Pallas,1776	*nw*		LC	S-IV
372	Motacillidae	Grey Wagtail	⌀ *Motacilla cinerea* Tunstall,1771	cw		LC	S-IV
373	Motacillidae	White Wagtail	⌀ *Motacilla alba* Linnaeus,1758	*cw*		LC	S-IV
374	Motacillidae	Large Pied Wagtail	● *Motacilla maderaspatensis* Gmelin,1789	*cr*		LC	S-IV
375	Campephagidae	Pied Flycatcher-Shrike	# *Hemipus picatus* (Sykes,1832)	*nr*		LC	S-IV
376	Prionopidae	Large Woodshrike	# *Tephrodornis gularis* (Raffles,1822)	*nr*		LC	S-IV
377	Tephrodornithidae	Common Woodshrike	# *Tephrodornis pondicerianus* (Gmelin,1789)	*nr*		LC	S-IV
378	Campephagidae	Large Cuckoo-Shrike	# *Coracina macei* Lesson,1830	*nr*		LC	S-IV
379	Campephagidae	Black-winged Cuckoo-Shrike	❍ *Coracina melaschistos* (Hodgson,1836)	*nw*		LC	S-IV
380	Campephagidae	Black-headed Cuckoo-Shrike	■ *Coracina melanoptera* (Riippel,1839)	*lcr*		LC	S-IV
381	Campephagidae	Ashy Minivet	⌘ *Pericrocotus divaricatus* (Raffles,1822)	*v*		LC	S-IV
382	Campephagidae	White-bellied Minivet	⌘ *Pericrocotus erythropygius* (Jerdon,1840)	*v*		LC	S-IV
383	Campephagidae	Scarlet Minivet	# *Pericrocotus flammeus* Forster,1781	*nr*		LC	S-IV
384	Campephagidae	Small Minivet	# *Pericrocotus cinnamomeus* Linnaeus,1766	*nr*		LC	S-IV
385	Campephagidae	Rosy Minivet	⌘ *Pericrocotus roseus* (Vieillot,1818)	v		LC	
386	Pycnonotidae	White-eared Bulbul	*Pycnonotus leucotis* (Gould,1836)			LC	
387	Pycnonotidae	Grey-headed Bulbul	# *Pycnonotus priocephalus* (Jerdon,1839)	*nr*	E	NT	S-IV

Table contd.

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
388	Pycnonotidae	Black-crested Bulbul	# *Pycnonotus melanicterus* (Gmelin,1789)	*nr*		LC	S-IV
389	Pycnonotidae	Red-whiskered Bulbul	● *Pycnonotus jocosus* (Linnaeus,1758)	*cr*		LC	S-IV
390	Pycnonotidae	Red-vented Bulbul	● *Pycnonotus cafer* (Linnaeus,1766)	*cr*		LC	S-IV
391	Pycnonotidae	White-browed Bulbul	■ *Pycnonotus luteolus* (Lesson,1841)	*lcr*		LC	S-IV
392	Pycnonotidae	Yellow-throated Bulbul	# *Pycnonotus xantholaemus* (Jerdon,1845)	*nr*	E	VU	S-IV
393	Pycnonotidae	Yellow-browed Bulbul	# *Acritillas indica* (Jerdon,1839)	*nr*		LC	S-IV
394	Pycnonotidae	Black Bulbul	# *Hypsipetes leucocephalus* Muller,1776	*nr*		LC	S-IV
395	Cisticolidae	Bright-headed Cisticola	# *Cisticola exilis* Vigors & Horsfield,1827	nr		LC	
396	Aegithinidae	Common Iora	● *Aegithina tiphia* (Linnaeus,1758)	*cr*		LC	S-IV
397	Choloropseidae	Golden - fronted Chloropsis	# *Chloropsis aurifrons* Temminck,1829	*nr*		LC	S-IV
398	Choloropseidae	Blue winged leaf bird	# *Chloropsis cochinchinensis* Gmelin,1789	*nr*		LC	S-IV
399	Irenidae	Asian Fairy - Bluebird	# *Irena puella* (Latham,1790)	*nr*		LC	S-IV
400	Laniidae	Rufous-backed Shrike	# *Lanius schach* Linnaeus,1758	*nr*		LC	S-IV
401	Laniidae	Southern Grey Shrike	■ *Lanius meridionalis* Temminck,1820	*lcr*		LC	S-IV
402	Laniidae	Great Grey Shrike	⌘*Lanius excubitor* Linnaeus,1758			LC	S-IV
403	Laniidae	Bay - backed Shrike	# *Lanius vittatus* Valenciennes,1826	*nr*		LC	S-IV
404	Laniidae	Brown Shrike	⌀*Lanius cristatus* Linnaeus,1758	cw		LC	S-IV
405	Turdidae	Tickell's Thrush	❍ *Turdus unicolor* Tickell,1833	nw		LC	
406	Turdidae	Eyebrowed Thrush	*Turdus obscures* Gmelin,1789			LC	
407	Muscicapidae	White - bellied Shortwing	*Myiomela major* (Jerdon,1844)	*nr*	E	EN	S-IV
408	Muscicapidae	Indian Blue Robin	◆ *Luscinia brunnea* (Hodgson,1837)	*nwp*		LC	S-IV
409	Muscicapidae	White-tailed Rubythroat	*Luscinia pectoralis* (Gould,1837)			LC	

Table contd.

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
410	Muscicapidae	Bluethroat	✡ *Luscinia svecica* (Linnaeus,1758)	lcw		LC	
411	Muscicapidae	Oriental Magpie-Robin	● *Copsychus saularis* (Linnaeus,1758)	*cr*		LC	S-IV
412	Muscicapidae	White-rumped Shama	# *Copsychus malabaricus* (Scopoli,1788)	*nr*		LC	S-IV
413	Muscicapidae	Black Redstart	❍ *Phoenicurus ochruros* (Gmelin,1774)	*nw*		LC	S-IV
414	Muscicapidae	Pied Bushchat	■ *Saxicola caprata* Linnaeus,1766	*lcr*		LC	S-IV
415	Muscicapidae	Common Stonechat	❍ *Saxicola torquatus* (Linnaeus,1766)	*nw*		LC	S-IV
416	Muscicapidae	Desert Wheatear	⌘ *Oenanthe deserti* (Temminck,1829)			LC	S-IV
417	Muscicapidae	Indian Robin	● *Saxicoloides fulicatus* (Linnaeus,1766)	*cr*		LC	S-IV
418	Muscicapidae	Blue-headed Rock Thrush	❍ *Monticola cinclorhynchus* (Vigors,1832)	*nw*		LC	S-IV
419	Muscicapidae	Blue Rock-Thrush	❍ *Monticola solitaries* (Linnaeus,1758)	*nw*		LC	S-IV
420	Turdidae	Malabar Whistling Thrush	# *Myophonus horsfieldii* Vigoo,1831	*nr*		LC	S-IV
421	Turdidae	Pied Thrush	☒ *Zoothera wardii* (Blyth,1843)	*np*		LC	S-IV
422	Turdidae	Orange-headed Thrush	# *Zoothera citrine* (Latham,1790)	*nr*		LC	S-IV
423	Turdidae	Scaly Thrush	# *Zoothera dauma* (Latham,1790)	*nr*		LC	S-IV
424	Turdidae	Eurasian Blackbird	*Turdus merula* Linnaeus,1758	*lcr*		LC	S-IV
425	Timaliidae	Spotted Babbler	# *Pellorneum ruficeps* Swainson,1832	*nr*		LC	S-IV
426	Timaliidae	Tawny-bellied Babbler	# *Dumetia hyperythra* (Franklin,1831)	*nr*		LC	S-IV
427	Timaliidae	Dark fronted Babbler	# *Rhopocichla atriceps* (Jerdon,1839)	*nr*		LC	S-IV
428	Timaliidae	Yellow-eyed Babbler	# *Chrysomma sinense* (Gmelin,1789)	*nr*		LC	S-IV
429	Timaliidae	Common Babbler	■ *Turdoides caudata* (Dumont,1823)	*lcr*		LC	S-IV
430	Timaliidae	Large Grey Babbler	■ *Turdoides malcolmi* (Sykes,1832)	*lcr*		LC	S-IV
431	Timaliidae	Indian Rufous Babbler	■ *Turdoides subrufa* (Jerdon,1839)	*lcr*	E	LC	S-IV
432	Timaliidae	Jungle Babbler	■ *Turdoides striata* (Dumont,1823)	*lcr*		LC	S-IV

Table contd.

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
433	Timaliidae	Yellow billed Babbler	● *Turdoides affinis* (Jerdon,1845)	*cr*		LC	S-IV
434	Timaliidae	Wynaad Laughingthrush	# *Garrulax delesserti* (Jerdon,1839)	*nr*	E	LC	S-IV
435	Timaliidae	Nilgiri Laughingthrush	■ *Trochalopteron cachinnans* (Jerdon,1839)		E	EN	S-IV
436	Timaliidae	Grey-breasted Laughing thrush	# *Trochalopteron fairbanki* Blanford,1869	*nr*	E	NT	S-IV
437	Timaliidae	Indian Scimitar-Babbler	# *Pomatorhinus horsfieldii* Sykes,1832	*nr*		LC	S-IV
438	Timaliidae	Brown cheeked fulvetta	# *Alcippe poioicephala* (Jerdon,1844)	*nr*		LC	S-IV
439	Cisticolidae	Streaked Fantail-Warbler	● *Cisticola juncidis* (Rafinesque,1810)	*cr*		LC	S-IV
440	Cisticolidae	Grey breasted Prinia	# *Prinia hodgsonii* Blyth,1844	*nr*		LC	S-IV
441	Cisticolidae	Plain Prinia	■ *Prinia inornata* Sykes,1832	*lcr*		LC	S-IV
442	Cisticolidae	Ashy Prinia	■ *Prinia socialis* (Sykes,1832)	*lcr*		LC	S-IV
443	Cisticolidae	Jungle Prinia	■ *Prinia sylvatica* (Jerdon,1840	*lcr*		LC	S-IV
444	Cisticolidae	Common Tailor Bird	● *Orthotomus sutorius* Pennant,1769	*cr*		LC	S-IV
445	Locustellidae	Broad-tailed Grass-Warbler	# *Shoenicola platyurus* Jerdon,1844	*nr*	E	VU	S-IV
446	Locustellidae	Pale Grasshopper-Warbler	❍ *Locustella naevia* (Boddaert,1783)	*nw*		LC	S-IV
447	Arcocephalidae	Thick - billed Warbler	❍ *Acrocephalus aedon* (Pallas,1766)	*nw*		LC	S-IV
448	Arcocephalidae	Indian Great Reed - Warbler	# *Acrocephalus stentoreus* Hemprich& Ehrenbeg ,1833		*nr*	LC	S-IV
449	Arcocephalidae	Blyth's Reed-Warbler	⌀ *Acrocephalus dumetorum* Blyth,1849	cw		LC	S-IV
450	Arcocephalidae	Paddyfield Warbler	❍ *Acrocephalus agricola* (Jerdon,1845)	*nw*		LC	S-IV
451	Arcocephalidae	Booted Warbler	❍ *Hippolais caligata* (Lichtenstein,1823)	nw		LC	S-IV
452	Sylviidae	Orphean Warbler	❍ *Sylvia hortensis* (Gmelin,1789)	*nw*		LC	S-IV
453	Sylviidae	Common Lesser Whitethroat	❍ *Sylvia curruca* (Linnaeus,1758)	*nw*		LC	S-IV

Table contd.

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
454	Phylloscopidae	Olivaceous Leaf-Warbler	❍ *Phylloscopus griseolus* Blyth,1847	*nw*		LC	S-IV
455	Phylloscopidae	Hume's Warbler	❍ *Phylloscopus humei* (Brooks,1878)	*nw*		LC	S-IV
456	Phylloscopidae	Tytler's Leaf-Warbler	⌘ *Phylloscopus tytleri* Brooks,1872	*v*		NT	S-IV
457	Phylloscopidae	Tickell's Warbler	❍ *Phylloscopus affinis* (Tickell,1833)	*nw*		LC	S-IV
458	Phylloscopidae	Common Chiffchaff	❍ *Phylloscopus collybita* Viellot,1817	*nw*		LC	S-IV
459	Phylloscopidae	Large-billed Leaf-Warbler	❍ *Phylloscopus magnirostris* Blyth,1843	*nw*		LC	S-IV
460	Phylloscopidae	Greenish Leaf-Warbler	ø *Phylloscopus trochiloides* (Sundevall,1837)	*cw*		LC	S-IV
461	Phylloscopidae	Western Crowned Warbler	❍ *Phylloscopus occipitalis* (Blyth,1845)	*nw*		LC	S-IV
462	Phylloscopidae	Blyth's Leaf-Warbler	⌘ *Phylloscopus reguloides* Blyth,1842			LC	S-IV
463	Muscicapidae	Asian Brown Flycatcher	✡ *Muscicapa dauurica* Pallas,1811	*lcw*		LC	S-IV
464	Muscicapidae	Brown-breasted Flycatcher	☒ *Muscicapa muttui* (Layard,1854)	*np*		LC	S-IV
465	Muscicapidae	Rusty-tailed Flycatcher	☒ *Muscicapa ruficauda* Swainson,1838	*np*		LC	S-IV
466	Muscicapidae	Red-throated Flycatcher	*Ficedula parva* (Bechstein,1792)	*lcw*		LC	S-IV
467	Muscicapidae	Kashmir Flycatcher	❍ *Ficedula subrubra* Hatert & Steinbacher,1934			VU	S-IV
468	Muscicapidae	Black and Orange Flycatcher	# *Ficedula nigrorufa* (Jerdon,1839)	*nr*	E	NT	S-IV
469	Muscicapidae	Little Pied Flycatcher	⌘ *Ficedula westermanni* (Sharpe,1888)			LC	S-IV
470	Muscicapidae	White-bellied Blue-Flycatcher	# *Cyornis pallipes* (Jerdon,1840)	*nr*	E	LC	S-IV
471	Muscicapidae	Blue-throated Flycatcher	❍ *Cyornis rubeculoides* (Vigros,1831)	*nw*		LC	S-IV
472	Muscicapidae	Tickell's Blue-Flycatcher	# *Cyornis tickelliae* Blyth,1843	*nr*		LC	S-IV
473	Muscicapidae	Ultramarine Flycatcher	❍ *Ficedula superciliaris* (Jerdon,1840)	nw		LC	
474	Muscicapidae	Verditer Flycatcher	❍ *Eumyias thalassinus* Swainson,1838	*nw*		LC	S-IV
475	Muscicapidae	Nilgiri Flycatcher	# *Eumyias albicaudatus* (Jerdon,1840)	*nr*	E	NT	S-IV

Table contd.

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
476	Stenostiridae	Grey-headed Flycatcher	❍ *Culicicapa ceylonensis* (Swainson,1820)	*nw*		LC	S-IV
477	Monarchidae	Black-naped Monarch-Flycatcher	# *Hypothymis azurea* (Boddaert,1783)	*nr*		LC	S-IV
478	Monarchidae	Asian Paradise-Flycatcher	# *Terpsiphone paradise* (Linnaeus,1758)	*nr*		LC	S-IV
479	Rhipiduridae	White-browed Fantail-Flycatcher	# *Rhipidura aureola* Lesson,1830	*nr*		LC	S-IV
480	Rhipiduridae	White-throated Fantail- Flycatcher	# *Rhipidura albicollis* (Vieillot,1818)	*nr*		LC	S-IV
481	Timaliidae	Striped Tit Babbler	# *Macronous gularis* Horsfield,1822	*nr*		LC	
482	Locustellidae	Bristled Grass-Warbler	# *Chaetornis striata* (Jerdon,1841)			**VU**	S-IV
483	Paridae	Great Tit	■ *Parus major* Linnaeus,1758	*lcr*		LC	S-IV
484	Paridae	White naped Tit	# *Parus nuchalis* Jerdon,1845	*nr*		VU	S-IV
485	Paridae	Black-Iored Yellow Tit	■ *Parus xanthogenys* Vigros,1831	*lcr*		LC	S-IV
486	Sittidae	Chestnut-bellied Nuthatch	# *Sitta castaneta* Lesson,1830	*nr*		LC	S-IV
487	Sitidae	Velvet-fronted Nuthatch	# *Sitta frontalis* Swainson,1820	*nr*		LC	S-IV
488	Dicaeidae	Thick-billed Flowerpecker	■ *Dicaeum agile* (Tickell,1833)	*lcr*		LC	S-IV
489	Dicaeidae	Tickell's Flowerpecker	● *Dicaeum erythrorhynchos* (Latham,1790)	*cr*		LC	S-IV
490	Dicaeidae	Plain Flowerpecker	# *Dicaeum concolor* (Jerdon,1840)	*nr*		LC	S-IV
491	Nectariniidae	Purple-rumped Sunbird	● *Leptocoma zeylonica* (Linnaeus,1766)	*cr*		LC	S-IV
492	Nectariniidae	Small Sunbird	● *Leptocoma minima* (Sykes,1832)	*cr*	E	LC	S-IV
493	Nectariniidae	Loten's Sunbird	# *Cinnyris lotenius* (Linnaeus,1766)	*nr*		LC	S-IV
494	Nectariniidae	Purple Sunbird	● *Cinnyris asiaticus* Latham,1790	*cr*		LC	S-IV
495	Nectariniidae	Crimson Sunbird	# *Aethopyga siparaja* (Raffles,1822)	*nr*		LC	S-IV

Table contd.

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
496	Nectariniidae	Little Spiderhunter	#*Arachnothera longirostra* (Latham,1790)	*nr*		LC	S-IV
497	Zosteropidae	Oriental White-eye	●*Zosterops palpebrosus* (Temminck,1824)	*cr*		LC	S-IV
498	Emberizidae	Red-headed Bunting	❍*Emberiza bruniceps* Brandt,1841	*nw*		LC	S-IV
499	Emberizidae	Blackheaded Bunting	☒*Emberiza melanocephala* Scopoli,1769	*np*		LC	
500	Emberizidae	Grey-necked Bunting	❍*Emberiza buchanani* Blyth,1844	*nw*		LC	
501	Fringillidae	Common Rosefinch	❍*Carpodacus erythrinus* (Pallas,1770)	*nw*		LC	S-IV
502	Estrildidae	Red Munia	■*Amandava amandava* (Linnaeus,1758)	*lcr*		LC	S-IV
503	Estrildidea	Green Avadavat	#*Amandava Formosa* (Latham,1790)	*nr*		VU	
504	Estrildidae	White-throated Munia	■*Lonchura malabarica* (Linnaeus,1758)	*lcr*		LC	S-IV
505	Estrildidae	White-rumped Munia	■*Lonchura striata* (Linnaeus,1766)	*lcr*		LC	S-IV
506	Estrildidae	Black-throated Munia	#*Lonchura kelaarti* (Jerdon,1863)	*nr*		LC	S-IV
507	Estrildidae	Spotted Munia	●*Lonchura punctulata* (Linnaeus,1758)	*cr*		LC	S-IV
508	Estrildidae	Black-headed Munia	*Lonchura Malacca* (Linnaeus,1766)	*nr*		LC	S-IV
509	Passeridae	House Sparrow	●*Passer domesticus* (Linnaeus,1758)	*cr*		LC	S-IV
510	Passeridae	Yellow-throated Sparrow	#*Petronia xanthocollis* (Burton,1838)	*nr*		LC	S-IV
511	Ploceidae	Baya Weaver	■*Ploceus philippinus* (Linnaeus,1766)	*lcr*		LC	S-IV
512	Ploceidae	Streaked Weaver	#*Ploceus manyar* (Horsfield,1821)	*nr*		LC	S-IV
513	Ploceidae	Black-breasted weaver	# *Ploceus benghalensis* (Linnaeus,1758)	*nr*		LC	
514	Sturnidae	Grey-headed Starling	#*Sturnia malabarica* (Gmelin,1789)	*nr*		LC	S-IV
515	Sturnidae	Common Starling	❍*Sturnus vulgaris* Linnaeus,1758	*nw*		LC	S-IV
516	Sturnidae	Asian Pied Starling	#*Sturnus contra* (Linnaeus,1758)			LC	S-IV
517	Sturnidae	Brahminy Starling	#*Sturnia pagodarum* (Gmelin,1789)	*nr*		LC	S-IV
518	Sturnidae	Rosy Starling	ø*Sturnus roseus* (Linnaeus,1758)	*aw*		LC	S-IV

Sl.No.	Family	Common Name	Scientific Name	Conservation Status	Endemic Status	Threat Status	Legal Status
519	Sturnidae	Common Myna	●*Acridotheres tristis* (Linnaeus,1766)	*cr*		LC	S-IV
520	Sturnidae	Jungle Myna	●*Acridotheres fuscus* (Wagler,1827)	*cr*		LC	S-IV
521	Sturnidae	Bank Myna	#*Acridotheres ginginianus* (Latham,1790)	*nr*		LC	S-IV
522	Sturnidae	Southern Hill Myna	#*Gracula indica* Linnaeus,1758	*nr*		LC	S-IV
523	Oriolidae	Eurasian Golden Oriole	#*Oriolus oriolus* (Linnaeus,1758)	*nr*		LC	S-IV
524	Oriolidae	Black-naped Oriole	☒*Oriolus chinensis* Linnaeus,1766	*np*		LC	S-IV
525	Oriolidae	Black-headed Oriole	#*Oriolus xanthornus* (Linnaeus,1758)	*nr*		LC	S-IV
526	Dicruridae	Black Drongo	●*Dicrurus macrocercus* (Vieillot,1817)	*cr*		LC	S-IV
527	Dicruridae	Ashy Drongo	⌀*Dicrurus leucophaeus* Vieillot,1817	*cw*		LC	S-IV
528	Dicruridae	White-bellied Drongo	■*Dicrurus caerulescens* (Linnaeus,1758)	*lcr*		LC	S-IV
529	Dicruridae	Bronzed Drongo	■*Dicrurus aeneus* Vieillot,1817	*lcr*		LC	S-IV
530	Dicruridae	Spangled Drongo	#*Dicrurus hottentottus* (Linnaeus,1766)	*nr*		LC	S-IV
531	Dicruridae	Greater Racket-tailed Drongo	#*Dicrurus paradiseus* Linnaeus,1766	*nr*		LC	S-IV
532	Artamidae	Ashy Woodswallow	# *Artamus fuscus* Vieillot,1817	*nr*		LC	S-IV
533	Corvidae	Indian Treepie	■ *Dendrocitta vagabunda* (Latham,1790)	*lcr*		LC	S-IV
534	Corvidae	White-bellied Treepie	■ *Dendrocitta leucogastra* Gould,1833	*lcr*	E	LC	S-IV
535	Corvidae	House Crow	● *Corvus splendens* Vieillot,1817	*cr*		LC	S-V
536	Corvidae	Jungle Crow	● *Corvus macrorhynchos* Wagler,1827	*cr*		LC	S-IV

●-Common resident; ☒-not common passage migrant; ⌘-Vagrant; #-not common resident; ⌀-Common winter visitor; ❍-not common winter visitor; ■-locally common resident; ✡-locally common winter visitor; ◆-not common winter visitor or passage migrant; ☼-not common summer visitor.

E- Species endemic to Western Ghats or Eastern Ghats, occurring in Tamilnadu; CR- Critical; EN- endangered; LC-Least Concern; VU- Vulnerable; NT- Near Threatened; S-I - Schedule I; S-IV- Schedule IV, S-V-Schedule - V, wildlife (Protection) Act 1972.

Zool. Surv. India
Fauna of Karnataka, State Fauna Series, **21** : 495-595, 2013

MAMMALIA

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INTRODUCTION

State of Karnataka occupying an area of about 1,91,791 sq. km. has been divided into four biogeographic zones, namely Coastal plains, Western Ghats, Southern Plateau and Northern Plateau with diverse forest types which include Mangrove, Wet-evergreen, Semi-evergreen, Moist deciduous, Dry deciduous, Dry evergreen, Thorn scrub and open grasslands. Such habitat diversity in a smaller area has resulted in expression of spectacular faunal diversity.

Previous studies have shown that this region is qualitatively rich in the faunal components. Earlier scientists and naturalists have recorded mammal species in their isolated reports based on the intensive surveys carried out in this region by them over a period of time (Wroughton, 1912, 1913; Wroughton and Ryley, 1913; Wroughton and Davidson, 1920; Tiwari *et al.* 1971, Karanth, 1986; Kumara and Singh, 2007 and many others).

Zoological Survey of India (ZSI) has conducted number of intensive surveys of the selected districts and conservation areas of Karnataka State resulting in publication of number of documents such as those on Nilgiri Biosphere Reserve (NBR) including Nagarhole National Park and Bandipur Tiger Reserve (Pradhan and Kurup, 2001); Bilgiri Rangaswamy Temple Wildlife Sanctuary (Aravind, 2006); Kudremukh National Park (Palot and Radhakrishnan, 2007) and Bannerghatta National Park (Valarmathi and Krishnan, 2007). However, there is no consolidated systematic account on the mammalian fauna available from this region. Therefore an attempt has been made, here, to present updated information on the mammal species and subspecies from the entire State of Karnataka.

Present chapter is based on the collections made by various ZSI survey parties, on the sighting observations and also on the records available from the literature (Ellerman and Morrison-Scott, 1951; Ellerman, 1961; Tiwari *et al.*, 1971; Prater, 1980; Karanth, 1986; Agrawal *et al.*, 1992; Corbet and Hill, 1992; Roberts, 1997; Pradhan and Kurup, 2001; Wilson and Reeder, 2005; CAMP Reports 1998, 2002, 2003 and 2005; Alfred *et al.* 2002, 2006a,b; Pradhan, 2008 and many more, a mention of which has been made in the appropriate places in the species-wise account). The chapter gives a systematic account of 137 mammalian species/subspecies including 11 marine mammal species with the added information on their past and recent records along with the comments on their current conservation status. Attempts have also been made to give keys wherever possible. There are number of changes in the taxonomic placements as indicated in Wilson and Reeder (2005) and Nameer (2008) which have been accepted by most of the workers. Hence, the systematic order reported by these authors has been followed here.

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SYSTEMATIC LIST OF THE MAMMAL SPECIES/SUBSPECIES

(* indicate species actually collected and/or sighted during project period)

Class MAMMALIA

Order ERINACEOMORPHA

Family ERINACEIDAE

Subfamily ERINACEINAE

1. Indian Hedgehog : *Paraechinus micropus* (Blyth)

Order SORICOMORPHA

Family SORICIDAE

Subfamily CROCIDURINAE

2. Horsfield Shrew : *Crocidura horsfieldii* (Tomes)

*3. Ceylon or montane Shrew : *Suncus montanus* (Kelaart)

*4. Common House Shrew : *Suncus murinus* (Lin.)

5. Savi's Pigmy Shrew : *Suncus etruscus* (Savi)

6. Anderson's Shrew : *Suncus stoliczkanus* (Anderson)

Order SCANDENTIA

Family TUPAIIDAE

7. Madras Tree Shrew : *Anathana ellioti ellioti* (Waterhouse)

Order CHIROPTERA

Suborder MEGACHIROPTERA

Family PTEROPODIDAE

*8. Rousettes or Indian fulvus fruit bat : *Rousettus l. leschenaulti* (Desmarest)

*9. Indian flying fox : *Pteropus giganteus giganteus* (Brunnich)

*10. Short-nosed fruit bat : *Cynopterus sphinx sphinx* (Vahl)

*11. Lesser Dog-faced fruit bat : *Cynopterus brachyotis ceylonensis* (Gray)

12. Long -tongued fruit bat : *Eonycteris spelaea spelaea* (Dobson)

Suborder MICROCHIROPTERA

Family RHINOPOMATIDAE

13. Lesser Mouse-tailed Bat : *Rhinopoma hardwickei hardwickei* (Gray)

Family EMBALLONURIDAE

Subfamily TAPHOZOINAE

14. Pouch-bearing tomb bat : *Saccolaimus saccolaimus* (Temminck)

15. Long winged tomb bat : *Taphozous l. longimanus* Hardwicke

16. Black-bearded tomb bat : *Taphozous m. melanopogon* Temminck

17. Naked-rumped tomb bat : *Taphozous nudiventris kachhensis* (Dobson)

18. Theobald's tomb bat : *Taphozous theobaldi secatus* Thomas

Family MEGADERMATIDAE

*19. Greater False vampire bat : *Megaderma (Lyroderma) l. lyra* Geoffroy

20. Lesser False vampire bat : *Megaderma spasma horsfieldii* Blyth

Family RHINOLOPHIDAE

*21. Rufous Horse-shoe bat : *Rhinolophus rouxii rouxii* Temminck

22. Blyth's Horse-shoe bat : *Rhinolophus lepidus lepidus* (Blyth)

23. Woolly Horse-shoe Bat : *Rhinolophus beddomei* Andersen

Family HIPPOSIDERIDAE

24. Dusky Leaf-nosed Bat : *Hipposideros ater ater* Templeton

25. Fulvus leaf-nosed bat : *Hipposideros fulvus fulvus* Gray

26. Anderson's Leaf-nosed Bat : *Hipposideros pomona pomona* Andersen

27. Kolar Leaf-nosed bat : *Hipposideros hypophyllus* Kock and Bhat

28. Cantor's Leaf-nosed Bat : *Hipposideros galeritus brachyotus* (Dobson)

29. Schneider's leaf-nosed bat : *Hipposideros speoris speoris* (Schneider)

30. Kelaart's leaf-nosed bat : *Hipposideros lankadiva indus* (Andersen)

Family VESPERTILIONIDAE

Subfamily VESPERTILIONINAE

Tribe **Eptesicini**

31. Tickell's Bat : *Hesperoptenus tickelli* (Blyth)

Tribe **Nycticeiini**

32. Asiatic greater yellow house bat : *Scotophilus heathii heathii* (Horsfield)
33. Asiatic lesser yellow house bat : *Scotophilus kuhlii kuhlii* Leach

Tribe **Pipistrellini**

34. Kelaart's Pipistrelle : *Pipistrellus ceylonicus indicus* (Dobson)
35. Indian Pipistrelle : *Pipistrellus coromandra coromandra* (Gray)
36. Indian Pigmy Pipistrelle : *Pipistrellus tenuis mimus* Wroughton
37. Dormer's Pipistrelle : *Scotozous dormeri* (Dobson)

Tribe **Vespertilionini**

38. Club-footed Bat : *Tylonycteris pachypus* (Temminck)

Subfamily MYOTINAE

39. Horsfield's Bat : *Myotis horsfieldii peshwa* (Thomas)
40. Burmese Whiskered Bat : *Myotis montivagus peytoni* (Wroughton & Ryley)

Subamily MINIOPTERINAE

41. Schreiber's Long-fingered Bat : *Miniopterus schreibersii fuliginosa* (Hodgson)
42. Small Long-fingered Bat : *Miniopterus pusillus pusillus* Dobson

Subfamily KERIVOULINAE

43. Painted Bat : *Kerivoula picta picta* (Pallas)
44. Hardwicke's Wooly Bat : *Kerivoula hardwickii depressa* (Miller)

Family MOLOSSIDAE

Subfamily MOLOSSINAE

45. Egyptian Free-tailed bat : *Tadarida aegyptiaca thomasi* Wroughton
*46. Wroughton's free-tailed Bat : *Otomops wroughtoni* (Thomas)

Order PRIMATES

Family LORISIDAE

47. Mysore Slender Loris : *Loris lydekkerianus lydekkerianus* Cabrera
48. Malabar Slender Loris : *Loris lydekkerianus malabaricus* Wroughton

Family CERCOPITHECIDAE

Subfamily CERCOPITHECINAE

*49. Bonnet Macaque : *Macaca radiata* (Geoffroy)
*50. Lion-tailed Macaque : *Macaca silenus* (Linnaeus)

Subfamily COLOBINAE

*51. Western Hanuman Langur : *Semnopithecus achates* (Pocock)
*52. Deccan Hanuman Langur : *Semnopithecus anchises* Blyth
*53. Black-footed Gray Langur : *Semnopithecus hypoleucos* Blyth
*54. Tufted Gray Langur : *Semnopithecus priam* Blyth
*55. Nilgiri Langur : *Trachypithecus johnii* (Fischer)

Order CARNIVORA

Suborder FELIFORMIA

Family FELIDAE

Subfamily FELINAE

*56. Jungle Cat : *Felis chaus kelaarti* Pocock
57. Leopard Cat : *Prionailurus bengalensis* (Kerr)
58. Rusty Spotted Cat : *Prionailurus rubiginosus rubiginosus* (Geoffroy)
59. Fishing Cat : *Prionailurus viverrinus* (Bennett)

Subfamily PANTHERINAE

*60. Leopard/Panther : *Panthera pardus fusca* (Meyer)
*61. Striped Tiger : *Panthera tigris tigris* (Linn.)

Family VIVERRIDAE

Subfamily PARADOXURINAE

*62. Asian Palm Civet : *Paradoxurus h. hermaphroditus* (Pallas)

*63. Jerdon's Palm Civet : *Paradoxurus jerdoni caniscus* Pocock

Subfamily VIVERRINAE

*64. Small Indian Civet : *Viverricula indica indica* (Desmarest)

*65. Malbar Large-spotted Civet : *Viverra civettina* Blyth

Family HERPESTIDAE

Subfamily HERPESTINAE

*66. Indian Gray Mongoose : *Herpestes edwardsii* (Geoffroy)

67. Ruddy Mongoose : *Herpestes smithii smithii* Gray

68. Brown Mongoose : *Herpestes fuscus fuscus* Waterhouse

*69. Stripe-naked Mongoose : *Herpestes vitticollis* Bennett

Family HYAENIDAE

*70. Striped Hyaena : *Hyaena hyaena* (Linnaeus)

Suborder CANIFORMIA

Family CANIDAE

*71. Indian Jackal : *Canis aureus* Linn

72. Gray wolf : *Canis lupus* Linnaeus

*73. Indian Wild Dog : *Cuon alpinus* (Pallas)

74. Bengal Fox : *Vulpes bengalensis* (Shaw)

Family URSIDAE

Subfamily URSINAE

*75. Sloth Bear : *Melursus ursinus* (Shaw)

Family MUSTELIDAE

Subfamily LUTRINAE

76. Oriental Small-clawed Otter : *Aonyx cinerea* Illiger

77. Common Otter : *Lutra lutra nair* Cuvier

78. Smooth-Coated Indian Otter : *Lutragale perspicillata* (Geoffroy)

Subfamily MUSTELINAE

79. South Indian Yellow-throated Marten : *Martes gwatkinsii* Horsfield

80. Ratal / Honey Badger : *Mellivora capensis* (Schreiber)

Order CETACEA

Suborder MYSTICETI

Family BALAENOPTRIDAE

81. Blue Whale : *Balaenoptera musculus* (Linnaeus)

82. Fin Whale : *Balaenoptera physalus* (Linnaeus)

Suborder ODONTOCETI

Family DELPHINIDAE

83. Common Dolphin : *Delphinus delphis* Linnaeus

84. Killer Whale : *Orcinus orca* (Linnaeus)

85. False Killer Whale : *Pseudorca crassidens* (Owen)

86. Indopacific Humpback Dolphin : *Sousa chinensis* (Osbeck)

87. Spinner Dolphin : *Stenella longirostris* (Gray)

88. Bottle-nosed Dolphin : *Tursiops truncatus* (Montagu)

Family PHOCOENIDAE

89. Back Finless Porpoise : *Neophocaena phocaenoides* (Cuvier)

Family PHYSETERIDAE

90. Sperm Whale : *Physeter macrocephalus* Linnaeus

Order SIRENIA

Family DUGONGIDAE

91. Dugong : *Dugong dugon* (Mueller)

Order PROBOSCIDEA

Family ELEPHANTIDAE

*92. Indian Elephant : *Elephus maximus indicus* Cuvier

Order ARTIODACTYLA

Family SUIDAE

*93. Indian Wild Boar : *Sus scrofa* (Linn.)

Family TRAGULIDAE

*94. Indian Mouse Deer or Chevrotain : *Moschiola meminna* (Erxleben)

Family CERVIDAE

Subfamily CERVINAE

*95. Indian Spotted Deer or Chital : *Axis axis* (Erxleben)

*96. Sambar : *Rusa unicolor* Kerr

*97. Barking Deer : *Muntiacus muntjak* (Zimmerman)

Family BOVIDAE

Subfamily ANTILOPINAE

98. Black Buck, Indian Antelope : *Antelope cervicapra* (Linnaeus)

99. Indian Gazelle, Chinkara : *Gazella bennettii* (Sykes)

Subfamily BOVINAE

*100. Indian Gaur : *Bos gaurus* Smith

101. Blue Bull : *Boselaphus tragocamelus* (Pallas)

102. Four Horned Antelope : *Tetramerous quadricornis* (Blainville)

Order PHOLIDOTA

Family MANIDAE

*103. Indian Pangolin : *Manis crassicaudata* Gray

Order RODENTIA

Suborder SCIUROMORPHA

Family SCIURIDAE

Subfamily CALLOSCIURINAE

*104. Indian palm squirrel : *Funambulus palmarum palmarum* (Linnaeus)

*105. Three striped jungle squirrel : *Funambulus tristriatus tristriatus* (Waterhouse)

*106. Three striped jungle squirrel : *Funambulus tristriatus numarius* Wroughton

107. Dusky Palm squirrel : *Funambulus sublineatus sublineatus* (Waterhouse)

108. Indian Five striped northern palm squirrel : *Funambulus pennantii pennantii* (Wroughton)

Subfamily RATUFINAE

109. Grizzled Indian Giant squirrel : *Ratufa macroura dendolena* Thomas and Wroughton

*110. Indian Giant Squirrel : *Ratufa indica indica* (Erxleben)

*111. Indian Giant Squirrel : *Ratufa indica maxima* (Schreiber)

Subfamily SCIURINAE

Tribe **Pteromyini**

112. Small Travancore Flying squirrel : *Petinomys fuscocapillus* (Jerdon)

*113. Common Giant Flying Squirrel : *Petaurista philippensis* (Elliot)

Suborder MYOMORPHA

Superfamily MUROIDEA

Family PLATACANTHOMYIDAE

114. Malabar Spiny Dormice : *Platacanthomys lasiurus* Blyth

Family MURIDAE

Subfamily GERBILLINAE

*115. Indian Gerbil or Antelope Rat : *Tatera indica* (Hardwicke)

Subfamily MURINAE

116. Nilgiri Vandeleuria : *Vandeleuria nilagirica* Jerdon

117. Indomalayan Vandeleuria: *Vandeleuria oleracea* (Bennett)

118. Soft-furred Metad: *Millardia meltada meltada* (Gray)

119. Blanford's Madromys/Blanford Rat : *Madromys blanfordi* (Thomas)

120. Cutch Rock Rat : *Cremnomys cutchicus* Wroughton

*121. House Rat or Roof Rat : *Rattus rattus rufescens* (Gray)

*122. White Bellied Rat : *Rattus rattus wroughtoni* (Hinton)

123. Sahyadri Forest Rat : *Rattus satarae* Hinton

124. Norvey Rat : *Rattus norvegicus* (Berkenhout)

125. Indian Bush Rat : *Golunda ellioti* Gray

*126. House Mouse : *Mus musculus castaneus* Waterhouse

127. Little Indian Field Mouse : *Mus booduga booduga* (Gray)

128. Wroughton's Small Spiny Mouse : *Mus phillipsi* Wroughton
129. Ryley's Spiny Mouse: *Mus cookii nagarum* Thomas
130. Brown Spiny Mouse : *Mus platythrix* Bennet
131. Elliot's Spiny Mouse : *Mus saxicola saxicola* Elliot
*132. Lesser Bandicoot Rat : *Bandicota bengalensis* (Gray)
133. Large Bandicoot Rat : *Bandicota indica malabarica* (Shaw)
*134. Large Bandicoot Rat : *Bandicota indica indica* (Bechstein)
135. Large Bandicoot Rat : *Bandicota maxima* Pradhan *et al.*

Suborder HYSTRICOMORPHA

Infraorder HYSTRICOGNATHI

Family HYSTRICIDAE

*136. Indian Crested Porcupine : *Hystrix indica* Kerr

Order LAGOMORPHA

Family LEPORIDAE

*137. Indian Black-naped Hare : *Lepus nigricollis* Cuvier

SYSTEMATIC ACCOUNT

Order ERINACEOMORPHA

Family ERINACEIDAE

Head and Body about 100–300 mm. Ear pinnae large. Back and sides covered with spines. Crown of first and second upper molars with a central 5th cusp. Members of this family commonly known as hedgehogs due to their pig-like snout.

Only one subfamily, Erinacinae, has been reported from India.

Subfamily ERINACEINAE

Dorsal pelage spiny. Tail short about 10% of the head and body length. Third lower premolar absent.

Only one genus of the subfamily Erinaceinae has been reported from Karnataka.

Genus ***Paraechinus***

Genus *Paraechinus* is represented by two species in India, of which only one has been reported from Karnataka State.

1. ***Paraechinus micropus*** (Blyth)

1846. *Erinaceus micropus* Blyth, *J. Asiat. Soc. Bengal*, **15** : 170.

1992. *Paraechinus micropus* : Corbet and Hill, *The Mammals of the Indomalayan region* : 22.

Common Name : Indian Hedgehog.

Diagnostic Characters : Head and Body length 140-230 mm. Ears small and round, length about 25 mm. Legs bearing shorter claws. Tail length 12 mm. Hind foot 25 mm. Tip of spine creamy white. Underpart of face and cheek grayish white. Limbs, belly, muzzle and areas around eyes clothed with reddish brown hairs. Spines on the forehead divided by a longitudinal naked furrow.

Locality : Menon (2003) reported hedgehog from Karnataka State.

Material Examined/Sightings : None.

Habitat : Found in rocky areas and grasslands.

Distribution : Gujarat, Maharashtra, Punjab, Rajasthan and Uttar Pradesh (Alfred *et al.*, 2006a).

Status : Rare, No authentic collection record from the state.

Conservation Status : IUCN criteria proposed as per CAMP Report 2005 : Least concern (National).

Source : Ellerman and Morrison-Scott (1951), Corbet and Hill (1992) and Wilson and Reeder (1993), Alfred *et al.* (2002, 2006a).

Remarks : Corbet and Hill (1992), Chakraborty and Agrawal (2000), and Wilson and Reeder (2005) consider *micropus* under the genus *Paraechinus*.

Order SORICOMORPHA

Family SORICIDAE

Back and sides of the body covered with soft hairs. The long pointed snout projecting

considerably beyond the lower lip. Skull without post-orbital processes. Zygomatic arches absent. Bullae imperfect. Crown of first and second upper molars without central fifth cusp. Members of this family are generally known as shrews.

Family Soricidae is represented by two subfamilies viz., Crocidurinae and Soricinae in India. Only Crocidurinae has been reported from Karnataka State.

Subfamily CROCIDURINAE

Subfamily Crocidurinae includes white-toothed shrews. Tail with a few scattered, long erect hairs and prominent fringes of white hairs on hind feet absent.

In India, subfamily Crocidurinae is represented by three genera, of which only two have been reported from Karnataka State.

Key to the genera of the subfamily CROCIDURINAE

– Four upper unicuspid premolars present; Total number of teeth 30 ..... ***Suncus***

– Three upper unicuspid premolars present; Total number of teeth 28 ..... ***Crocidura***

Genus ***Crocidura***

Head and Body length in the range of 60-120 mm. Fourth upper unicuspid premolar absent, only three upper unicuspid premolars present.

In India, genus *Crocidura* is represented by nine species, of which only one has been reported from Karnataka State.

2. ***Crocidura horsfieldii* (Tomes)**

1856. *Sorex horsfieldi* Tomes, *Ann. Mag. Nat. Hist.*, ser. 2, **17** : 23.

2008. *Crocidura horsfieldii*: Nameer, P.O., *Zoos' Print*, XXIII (8) : 5.

Common Name : Horsfield's shrew.

Diagnostic Characters : Head and Body length in the range of 60 - 75 mm. Tail length shorter than head and body length, ranges between 40-45 mm in length. Hind foot approximately 12 mm in length. Dorsal pelage soft and medium brown in colour.

Locality : Mysore (Rao and Aswathnaryana, 1978).

Material Examined/Sightings : None.

Habitat : Nocturnal and semi-fossorial in habit. Montane forests of Southern India (Menon, 2003).

Distribution : Fragmented distribution in India; Karnataka (Rao and Aswathanarayana (1978); Jammu & Kashmir (Chakraborty, 1983), Maharashtra (Talmale, 2007).

Status : Rare.

Conservation Status : IUCN criteria proposed as per CAMP Report 2005 : Vulnerable (National), Least concern (South Asia).

Source : Ellerman and Morrison-Scott (1951), Rao and Aswathnaryana, 1978, Corbet and Hill (1992) and Wilson and Reeder (2005), Alfred *et al.* (2002).

Remarks : Isolated record from Mysore reported only once in 1978 needs further confirmation of its occurrence in this state.

Genus ***Suncus***

Head and Body length in the range of 35-150 mm. Tail usually shorter than Head and Body length. 4th upper unicuspid premolar present.

Distribution : South Asia, south Europe, Africa (Corbet and Hill, 1992).

Five species of the genus *Suncus* are reported from India, of these, four have been reported from Karnataka State.

Key to the species of the genus *Suncus*

1. Body colour dark, brown or almost black ... . *Suncus montanus*

– Body colour light, gray to grayish brown.... 2

2. Head and body length 35-55; upper toothrow 5.3–6.4 mm ..... *Suncus etruscus*

– Head and body length more than 60 mm; Upper toothrow more than 6.5 3

3. Head and body length 60-80; upper toothrow 8.7-10 mm ..... *Suncus stoliczcanus*

– Head and body length 100-160; upper toothrow 12.4-16 mm .....*Suncus murinus*

*3. ***Suncus montanus*** (Kelaart)

1850. *Sorex montanus* Kelaart, *J. Ceylon Br. Asiat. Soc.,* **2** : 211.

2002. *Suncus montanus* : Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.* **199** : 12-13.

Common Name : Ceylon or montane shrew.

Diagnostic Characters : Head and Body length in the range of 80-105 mm. Tail length averages 45 to 65 mm. Fur with long soft hairs. Colour dark brown, almost black in colour.

Locality : Karnataka State (Alfred *et al.*, 2006a).

Material Examined/Sightings : One specimen collected from Masinagudi, Bandipur Tiger Reserve available in ZSI,WRC collection (M/572).

Habitat : Inhabits humid forests of hilly region (Alfred *et al.*, 2006a).

Distribution : Kerala and Tamil Nadu in India (Pradhan, 2002) and Pradhan and Kurup (2001).

Status : Rare.

Conservation Status : IUCN criteria proposed as per CAMP Report 2005 : Endangered (National and South Asia).

Source : Corbet and Hill (1992) and Wilson and Reeder (2005), Pradhan and Kurup (2001) and (Alfred *et al.* (2002, 2006a,b).

Remarks : Nil.

*4. ***Suncus murinus*** (Linnaeus)

1766. *Sorex murinus* Linnaeus, *Systema naturae*, **12th** ed : 74.

2008. *Suncus murinus*: Nameer, P.O., *Zoos' Print,* XXIII(8) : 5.

Common Name : House shrew.

Diagnostic Characters : Largest of the Indian house shrews (Head and Body Length in the range of 100-160 mm); Fur short, less than 5 mm in length. Tail thick at the base with sparsely distributed long hairs.

Locality : Karnataka State.

Material Examined/Sightings : One specimen collected from Periyapatanam range, Nagarhole National Park (ZSI, WRC coll : M/571). Palot and Radhakrishnan (2007) reported from Kudremukh National Park, Karnataka State.

Habitat : Terrestrial, fossorial, occasionally seen in all sorts of habitats particularly near human dwellings, crop fields and in forests.

Distribution : Throughout India.

Status : Common.

Conservation Status : IUCN criteria proposed as per CAMP Report 2005: Least concern (National).

Source : Lindsay (1929), Ellerman and Morrison-Scott (1951), Corbet and Hill (1992), Wilson and Reeder (1993, 2005) and Pradhan and Kurup (2001).

Remarks : Nil

5. ***Suncus etruscus*** (Savi)

1822. *Sorex etruscus* Savi, *Nuovo Giorn. de Letterati, Pisa* **1** : 60.

2002. *Suncus etruscus* : Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.* **199** : 12.

Common Name: English: Savi's Pygmy Shrew.

Diagnostic Characters : Head and Body length less than 55 mm. Hind feet in the range between 7.0-9.5 mm. Fur very short, vibrissae on tail present, 18 teeth present in upper jaw, zygomatic arches absent, bullae imperfect, dorsum medium to dark brown in colour.

Locality : Karnataka State.

Material Examined/Sightings : None.

Distribution : Throughout India.

Habitat : Fossorial in habit preferring to live in multiparous habitats on plains and high altitudes.

Status : Uncommon locally.

Conservation Status : IUCN criteria proposed as per CAMP Report 2005 : Least Concern (National).

Source : Lindsay (1929), Ellerman and Morrison-Scott (1951), Corbet and Hill (1992), Wilson and Reeder (2005) and Pradhan and Kurup (2001).

Remarks : Perhaps the smallest of all the terrestrial mammals in size.

6. ***Suncus stoliczkanus*** (Anderson)

1877. *Crocidura* (*Pachyura*) *stoliczkana* Anderson, *J. Asiat. Soc. Bengal*, **46** : 270.

2002. *Suncus stoliczkanus* : Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.*, **199** : 14.

Common Name : Anderson's Shrew.

Diagnostic Characters : Medium sized shrew with Head and Body length averages 57.5 mm (Range 45-70 mm). Tail length shorter than Head and Body length with an average of 48 mm (Range 37-50 mm); Vibrissae on tail present; Tail slender and not swollen at the base like that of *S. murinus*. Hind foot ranges between 7.5-11.5 mm. Snout short and broad. Eyes small. Fur very soft and silky. Dorsum medium grayish brown, under parts pale grey in colour.

Locality : Karnataka State.

Material Examined/Sightings : None.

Habitat : Nocturnal and semi-fossorial in habit; Lives in gardens near human dwellings and also in grassy and scrubland habitats near forest fringes (Alfred *et al.*, 2006a).

Distribution : Peninsular India from Chennai (Tamil Nadu) north to Punjab and Rajasthan (Alfred *et al.*, 2002).

Status : Uncommon.

Conservation Status : IUCN criteria proposed as per CAMP Report 2005 : Least concern (National).

Source : Lindsay (1929), Ellerman and Morrison-Scott (1951), Corbet and Hill (1992) and Wilson and Reeder (2005).

Remarks : Nil.

Order SCANDENTIA

Animals with long snout like a shrew without whiskers, long bushy distichous tail like a squirrel and appearance like a small mongoose when running. Functional digits on fore and hind limbs 5/5 in number. $I^2 = I^1$ and C_1 = adjacent teeth in size.

The order contains a single family.

Family TUPAIIDAE

Family Tupaiidae is represented by only one genus *Anathana* with a single species *A. ellioti* from Karnataka State.

Genus ***Anathana***

Out of the three subspecies of *A. ellioti*, only nominate subspecies occurs in Karnataka State.

7. ***Anathana ellioti ellioti*** (Waterhouse)

1850. *Tupaia ellioti* Waterhouse. *Proceedings zool. soc. Lond.*, : 106-108.

1992. *Anathana ellioti ellioti* : Corbet and Hill, *The Mammals of the Indomalayan region* : 38.

Common Name : Madras Tree-shrew.

Diagnostic Characters : Dorsal colour reddish brown, ventral side light yellow, tail bushy and darker than the back.

Locality : Karnataka State.

Material Examined/Sightings : None.

Habitat : Lives in a scrubby jungle and dry, moist deciduous forests. Terrestrial, arboreal diurnal and omnivorous in habit feeding on both fruits and invertebrates.

Distribution : Peninsular India.

Status : Endemic to India.

Conservation Status : IUCN criteria proposed as per CAMP Report, 2005 : Near Threatened (National); *CITES* : Appendix II (Family Tupaiidae).

Source : Prater (1980) and Corbet and Hill (1992), Wilson and Reeder (2005) and Alfred *et al.* (2002, 2006b).

Remarks : Nil.

Order CHIROPTERA

Presence of membranous wings between elongated digits 2-5 of forelimb and hind leg help in sustained flight. This order is represented in Karnataka State by 39 species under 20 genera of eight Chiropteran families. Chiroptera is second largest mammalian order next to Rodentia. It is divided into two suborders (1) *Megachiroptera* or fruit eating bats and (2) *Microchiroptera*, the predominantly insect-eating bats. Suborder *Megachiroptera* is represented by a single family *Pteropodidae* (Old World fruit bats) in Karnataka State.

Key to the suborders of the order Chiroptera

– Ear margins uninterrupted forming a complete ring, Tragus and Noseleaf absent, 2nd digit usually with a claw, Tail short and Molars simple, flat-crowned or with simple cusps, Fruit eating bats ..... MEGACHIROPTERA

– Ear margins interrupted and does not form a complete ring, Either Tragus or Noseleaf or both present, 2nd digit without any claw, Tail usually well developed and Molars complex with regular pattern of cusps and ridges forming definite "W" or"N" surface outline, Predominantly insect eating bats .... MICROCHIROPTERA

Suborder MEGACHIROPTERA

Family PTEROPODIDAE

Five species/subspecies under four genera of the family *Pteropodidae* have been recorded from the Karnataka State.

Key to the species/subspecies of the family PTEROPODIDAE

1. Claw on second digit present.....2

– Claw on second digit absent .... *Eonycteris spelaea*

2. Upper part of one colour throughout; medium sized bats (Forearm Length 55.0-90.0 mm.) 3

– Hind neck and shoulders paler than back; large sized bats (Forearm Length 110-209 mm.) ..... *Pteropus giganteus giganteus*

3. Four upper and five lower cheek teeth.....4

– Five upper and six lower cheek teeth .... *Rousettus leschenaulti leschenaulti*

4. Forearm length less than 67.0 mm, while Condylobasal length less than 29.5 mm, Ears with poorly developed pale margin .... *Cynopterus brachyotis ceylonensis*

– Forearm length more than 67.0 mm, while Condylobasal length between 29.5-35 mm., Ears with well developed pale margin .... *Cynopterus sphinx sphinx*

Genus ***Rousettus***

Rousettus is represented by a single species/ subspecies in Karnataka State.

*8. ***Rousettus leschenaulti leschenualti***

(Desmarest)

1820. *Pteropus leschenaulti* (Desmarest) *Encyl. Meth. Mammal*, **11** : 110.

2002. *Rousettus leschenaulti leschenaulti* : Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.*, **199** : 28.

Common Name : Rousettes or Indian fulvus fruit bat.

Diagnostic Characters : A medium sized fruit bat with forearm around 80 mm. It has a long muzzle and large eyes, tail reduced and rod like, dorsal colour light brown with a rufescent tinge, while ventral side is lighter in colour, back of the neck and shoulders sparsely haired.

Locality : Reported from Virajpet, Nagarhole, Krishnapur, Belgaum, Gersoppa, Hampi and Muroor in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : one specimen collected from Putter, South Kanara Dist., Karnataka State (ZSI, WRC collection M/550).

Habitat : Terrestrial, arboreal, forming gregarious noisy roosts, preferring to live in caves

and man-made constructions. Colonies can be recognized from those of insectivorous bats by the large brilliant eyes.

Distribution : Peninsular India.

Status : Many roosting sites have been reported from number of localities; IUCN Criteria proposed as per CAMP report (2002): Least Concern (National); Indian Wildlife (Protection) Act (1972) (as amended up to 2006) : Schedule V (Vermin).

Source : Brosset (1962a), Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Bates and Harrison (1997) and Pradhan and Kurup (2001).

Remarks : Nil.

Genus ***Pteropus***

Genus *Pteropus* is represented by a single species/subspecies in Karnataka State.

*9. ***Pteropus giganteus giganteus*** (Brunnich)

1782. *Vespertilio gigantea* Brunnich, *Dyrenes Historie*, **1** : 45.

1997. *Pteropus giganteus giganteus*: Bates and Harrison, *Bats of Indian Subcontinent*: 9-13.

Common Name : Indian flying fox.

Diagnostic Characters : Largest sized fruit bat in India; rufous-brown around head and neck; a conspicuous orange or honey-coloured band across upper back; lower back blackish brown; ventral parts dark chestnut brown; naked wing with naked skin; uropatagium, ears and muzzle jet black; no external tail.

Locality : Reported from Avatgi, Devicop, Hawsbhavi, Honkan, Vijaynagar, Kolar, Seringapatam in Karnataka State (Bates and Harison, 1997); Nagarhole National Park (Pradhan and Kurup, 2001).

Material Examined/Sightings : Sighted at many places in forested as well as in the urban areas on big trees.

Habitat : Found in all habitats, leading arboreal life with roosting in hundreds on large fruit bearing trees. Possesses strong memory and fly away from roosting place for large distances in search of food.

Distribution : Throughout India.

Status : Roosting sites are seen generally in isolated places, IUCN criteria proposed as per CAMP Report (2002) : Least Concern (National); Indian Wildlife (Protection) Act (1972, as amended up to 2006) Schedule: Schedule V (Vermin); CITES : Appendix II.

Source : Brosset (1962a), Corbet and Hill (1992) Wilson and Reeder (1993, 2005), Bates and Harrison (1997) and Pradhan and Kurup (2001).

Remarks : The species is involved in domestic illegal trade (Pradhan, 1997).

Genus ***Cynopterus***

Genus *Cynopterus* is represented by two species/subspecies in Karnataka State.

*10. ***Cynopterus sphinx sphinx*** (Vahl)

1797. *Vespertilio sphinx* (Vahl) *Skr. Nat. Selsk* Copenhagen, **4**(1) : 123.

2002. *Cynopterus sphinx sphinx* : Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.* **199** : 24.

Common Name : Short-nosed Fruit Bat.

DiagnosticCharacters : Medium sized fruit bat with white margined ears, forearm around 70 mm. with metacarpals and phalanges whitish, nostrils divergent with deep inter-narial groove, naked skin of wings and muzzle, tail reduced and rod like, condylobasal length more than 30 mm.

Localty : Reported from Bangalore, Mysore, Dharwar, Seringapatam, Belgaum, Hampi, Mangalore in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : Three specimens collected from Putter, South Kanara Dist. and Four specimens from Nagarhole National Park (ZSI,WRC collection M/551, 528, 531).

Habitat : Terrestrial and arboreal species preferring to live in small colonies on fruit bearing trees close to forests.

Distribution : Indian sub-continent; .. *Status* : IUCN Criteria proposed as per the CAMP Report (2002) : Least Concern; Indian Wildlife (Protection) Act (1972, as amended up to 2006) Schedule: Schedule V(Vermin).

Source : Brosset (1962a), Corbet and Hill (1992) and Wilson and Reeder (1993, 2005), Bates and Harrison (1997) and Pradhan and Kurup (2001).

Remarks : Nil.

*11. ***Cynopterus brachyotis ceylonensis*** (Gray)

1871. *Cynopterus marginatus* var. *ceylonensis* Gray, *Catalogue of monkeys, lemurs and fruit-eating bats in the collection of the British Museum*, London, British Museum : **viii** : 122.

2002. *Cynopterus brachyotis ceylonensis*: Alfred, Sinha and Chakraborty, *Rec. zool Surv. India, Occ. Paper No.* **199** : 23-24.

Common Name : Lesser dog-faced fruit bat.

Diagnostic Characters : Medium sized fruit bat with shorter forearm (less than 67 mm) and ears with no white margin, skin of wings and muzzle naked, nostrils divergent, condylobasal length less than 30 mm. Other characters similar to the previous sub-species.

Locality : Reported from Jog falls and Sirsi of Karnataka State (Bates and Harrison, 1997)

Material Examined/Sightings : Collected four specimens from Nagarhole National Park, Karnataka State (ZSI,WRC collection M/530).

Habitat : Same as that of *Cynopterus sphinx sphinx* (Vahl), both the species reported to have shared a common roost (Pradhan and Kulkarni 1997).

Distribution : Western Ghats and Sri Lanka.

Status : Pradhan and Kulkarni (1997) report extension of distributional range of *C. b. ceylonensis* up to Khandala in Pune Dist. in Northern Western Ghats. IUCN Criteria proposed as per the CAMP Report (2002) : Least Concern (For *Cynopterus brachyotis*); Indian Wildlife (Protection) Act (1972, as amended up to 2006) Schedule: Schedule V (Vermin).

Source : Das (1986), Corbet and Hill (1992), Wilson and Reeder (1993, 2005) Pradhan and Kulkarni (1997), Bates and Harrison (1997) and Pradhan and Kurup (2001).

Remarks : Nil.

Genus ***Eonycteris***

12. ***Eonycteris spelaea spelaea*** (Dobson)

1871. *Macroglossus spelaeus* Dobson, *Proc. Asiat. Soc. Bengal.* : 105-106.

2002. *Eonycteris spelaea spelaea*: Alfred, Sinha and Chakraborty, *Rec. zool Surv. India, Occ. Paper No.* **199** : 29-30.

Common Name : Long-toungued Fruit Bat.

Diagnostic Characters : Medium sized fruit bat with forearm length ranging between 66-78 mm. Fur short, velvety, dark brown above, underside mottled grey-brown. This species superficially resembles small *Rousettus leschenaulti* but differs in the absence of a claw on the second digit.

Locality : Reported from Nislneer and Muroor in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None.

Habitat : Inhabits variety of habitats including forest clad hill slopes and cultivated areas; roosts in caves.

Distribution : Andhra Pradesh, North-East India, West Bengal, Uttaranchal and Andman Island.

Status : Common. IUCN Criteria proposed as per the CAMP Report (2002) : Least Concern (National), Indian Wildlife (Protection) Act (1972, as amended up to 2006) Schedule: Schedule V (Vermin).

Source : Ellerman and Morrison-Scott (1951), Corbet and Hill (1992), Wilson and Reeder (1993, 2005) and Bates and Harrison (1997).

Remarks : Nil

Suborder MICROCHIROPTERA

Seven families represent sub-order Microchiroptera in Karnataka State.

Key to the families of the Suborder MICROCHIROPTERA

1. Both noseleaf and tragus present ..... MEGADERMATIDAE

– Either noseleaf or tragus present, but not both 2

2. A noseleaf, but no tragus present 3

– No noseleaf, but tragus present 4

3. Noseleaf with sella and posterior lancet, three lower premolars ..... RHINOLOPHIDAE

– Noseleaf without sella and posterior lancet, two lower premolars ..... HIPPOSIDERIDAE

4. Tail entirely enclosed in interfemoral membrane ..... VESPERTILIONIDAE

– Distal portion of tail free from interfemoral membrane 5

5. Tail emerging from upper surface of interfemoral membrane ..... EMBALLONURIDAE

– Tail emerging from end of interfemoral membrane 6

6. Tail very long and slender ..... RHINOPOMATIDAE

– Tail comparatively short and stout ..... MOLOSSIDAE

Family RHINOPOMATIDAE

Tail long, projecting beyond the edge of interfemoral membrane for more than ½ of its length, free portion slender, thread like. Ears joined over forehead by membrane, tragus well developed. Second and third digits of each wing have two distinct bony phalanges.

Family Rhinopomatidae consists of a single genus *Rhinopoma* E. Geoffroy.

Genus *Rhinopoma*

Genus *Rhinopoma* is represented by only one species in Karnataka State

13. ***Rhinopoma hardwickei hardwickei*** Gray

1831. *Rhinopoma hardwickei* Gray, *Zool. Misc.*, **1** : 37. (Type Locality : India)

2002. *Rhinopoma hardwickei hardwickei*: Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.* **199** : 31.

Common Name : Lesser Mouse-tailed Bat.

Diagnostic Characters : Medium sized bat with forearm length about 58.34 mm. Tail length 63.57 mm in average, longer than forearm. A small but well defined triangular dermal ridge present on the snout. Pelage uniform light grey brown on the back and slightly pale on the belly, Lower back and belly naked. Upper incisor minute. Single upper premolar (pm^4) present. Lower incisors tricuspidate. First lower premolar (pm_2) oval shaped.

Locality : Reported from Vijaynagar, Pattadkal, Badami, Gokarna, Gadag in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None.

Habitat : The species favours dry and semi-desert areas, sub-tropical dry evergreen forests and tropical thorn forests. Diurnal roost includes caves, deserted houses ruins and cracks amongst boulders, temples. Diet includes moths, beetles, neuropterans etc. (Bates and Harrison, 1997).

Distribution : Throughout India.

Status : Rare, IUCN criteria proposed as per CAMP Report 2002: Least Concern (National).

Source : Brosset (1962a), Bhat and Sreenivasan (1972), Corbet and Hill (1992), Wilson and Reeder (1993), Bates and Harrison (1997) and Alfred *et al.* (2002).

Remarks : Nil.

Family EMBALLONURIDAE

Subfamily TAPHOZOINAE

Family Emballonuridae is represented by two genera *Saccolaimus* and *Taphozous,* in Karnataka State.

Key to the genera of the Subfamily Taphozoinae under Emballonuridae

– Radio-metacarpal pouch absent, lower lip with a deep median groove, anterior upper premolar

large, tympanic bullae complete and postero-ventral face of basisphonoid in contact with tympanic bulla ..... ***Saccolaimus***

– Radio-metacarpal pouch present, lower lip not or scarcely grooved, Anterior upper premolar normal, tympanic bullae not complete and posteroventral face of basisphenoid not in contact with tympanic bulla ..... ***Taphozous***

Genus ***Saccolaimus***

Genus *Saccolaimus* is represented by only nominate species in Karnataka State.

14. ***Saccolaimus saccolaimus*** (Temminck)

1838. *Taphozous saccolaimus* Temminck, *Tijdschrift Natuurl. of Gesch. Physiol.*, **5** : 14.

2008. *Saccolaimus saccolaimus* : Nameer, P.O., Zoos' Print, XXIII (8) : 7.

Common Name : Naked-rumped Pouched Bat or Pouch-bearing Tomb Bat.

Diagnostic Characters : A large brown coloured *Saccolaimus* sp. with lower lip divided by a deep, narrow groove; legs and feet naked; interfemoral membrane naked except near the point of origin of tail; gular sac present, larger in males; radio metacarpal pouch absent; ear margin smooth; Tympanic bullae complete. Anterior upper premolar large, covering ½ crown area of posterior premolar.

Locality : Reported from Sirsi, Gersoppa, Malgi, Jellopur, Kadakola in Karnataka by Bates and Harrison (1997).

Material Examined/Sightings : None.

Habitat : Though not much information is available about its habit and habitat, the species is reported to inhabit the caves, ruins of tunnels, mine, temples etc..

Distribution : Throughout India.

Status : Though not rare, it is rather difficult to collect, IUCN criteria proposed as per CAMP Report 2002: Least Concern (National, for *Taphozous saccolaimus*).

Source : Brosset (1962a), Corbet and Hill (1992), Wilson and Reeder (1993), Bates and Harrison (1997) and Alfred *et al.* (2002).

Remarks : Nil.

Genus ***Taphozous***

Genus *Taphozous* is represented by four species/subspecies in Karnataka State.

Key to the species of Genus *Taphozous*

– Gular pouch well developed in male, while rudimentary in females. Forearm length in the range between 55.5-65 mm. Ears small below 20 mm ..... *Taphozous l. longimanus*

– Gular pouch in male not developed or absent in both sexes. Forearm length in the range between 60-68 mm. Ears smaller below 21 mm ..... *Taphozous m. melanopogon*

– Gular pouch absent in both sexes. Forearm length 70-76 mm and Ears larger, above 21 mm ..... *Taphozous theobaldi secatus*

– Gular pouch present in both sexes. Forearm length 71 to 80 mm and Ears larger, 18-25 mm ..... *Taphozous nudiventris kachhensis*

15. ***Taphozous longimanus longimanus*** Hardwicke

1825. *Taphozous longimanus* Hardwicke. *Trans Lin. Soc. Lond*; **14** : 525.

2002. *Taphozous longimanus longimanus*: Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India,Occ. Paper No.*, **199** : 33

Common Name : Long-winged tomb bat.

Diagnostic Characters : A brown coloured medium sized insect eating bat with broad tragus. Gular sac well developed in males, while it is represented by a rudimentary fold of naked skin in females. Inner margin of ear smooth, lower lip scarcely grooved.

Locality : Reported from Dharwar, Sirsi, Sagar, Vijaynagar and Kolar in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None.

Habitat : A colonial species inhabiting old ruins, caves, tree holes etc..

Distribution : Throughout India.

Status : General field study reports number of locations in isolated places (CAMP, 1998); IUCN criteria proposed as per CAMP Report (2002): Least Concern (National).

Source : Brosset (1962a), Corbet and Hill (1992), Wilson and Reeder (1993); and Bates and Harrison (1997) and Alfred *et al.* (2002).

Remarks : Nil.

16. ***Taphozous melanopogon melanopogon*** Temminck

1841. *Taphozous melanopogon* Temminck, *Monographies de mammalogie tome 2. Leiden & Paris,* 392 pp. Pl. xxvi–lxx.

2002. *Taphozous melanopogon melanopogon*: Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper* No., **199** : 33.

Common Name : Black Bearded Tomb Bat.

Diagnostic Characters : Medium sized insect eating brown coloured bat with tail emerging from the upper surface of the inter-femoral membrane. Gular sac rudimentary or absent in males and absent in females. Forearm less than 70 mm, anterior upper margin of zygoma flat and inferior ante-orbital process well developed;

Locality : Karnataka State (Bates and Harrison, 1997), Nilgiri Biosphere Reserve parts of Karnataka in Western Ghats (Pradhan and Kurup (2001).

Material Examined/Sightings : None;

Habitat : A colonial species inhabiting the caves, old mines, tunnels, temples etc..

Distribution : Throughout India.

Status : General field study reports number of locations in isolated places (CAMP, 2002); IUCN criteria proposed as per CAMP Report (2002): Least Concern (National).

Source : Brosset (1962a), Corbet and Hill (1992), Wilson and Reeder (1993, 2005); Bates and Harrison (1997) and Pradhan and Kurup (2001).

Remarks : Nil.

17. ***Taphozous nudiventris kachhensis*** Dobson

1872. *Taphozous kachhensis* Dobson, *J. Asiat. Soc. Bengal,* **41**(2) : 221.

1997. *Taphozous nudiventris kachhensis* : Bates and Harrison, *Bats of Indian Subcontinent* : 46-48.

2003. *Taphozous nudiventris kachhensis*: Das, P.K. , *Rec. zool. Surv. India, Occ. Paper No.* **217** : 56-57.

Common Name : Naked-rumped Tomb Bat.

Diagnostic Characters : Medium sized bat with an average forearm length 74 mm. It is characterized by its naked rump. Prominent gular sac present in males, additionally deep circular gland in the upper part of the chest present; In females the gular sac less visible and the gland absent. Ears long and rather narrow, blackish brown in colour and semi translucent. Pelage on dorsal surface dark brown, paler brown on the ventral surface. Radio-metacarpal pouch moderately developed.

Locality : Reported from Vijaynagar, Sivasamudram, Badami, Pattadkal, Sirsi in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None.

Habitat : Colony generally of a few individuals, prefers arid and semi-arid areas.

Distribution : Widespread in throughout India.

Status : IUCN criteria proposed as per CAMP Report (2002): Least Concern (National), (For *Taphozous nudiventris*).

Source : Brosset (1962a), Corbet and Hill (1992), Wilson and Reeder (1993, 2005); Bates and Harrison (1997) and Alfred *et al.* (2002).

Remarks : Nil.

18. ***Taphozous theobaldi secatus*** Thomas

1915. *Taphozous theobaldi secatus* Thomas, *J.Bombay nat. Hist. Soc.*, **24** : 60.

1997. *Taphozous theobaldi secatus* : Bates and Harison, *Bats of the Indian Subcontinent* Harrison Zoological Museum : 45-46.

Common Name : Theobald's Tomb Bat.

Diagnostic Characters : Medium sized insect eating brown coloured bat with tail emerging from

the upper surface of the inter-femoral membrane. Gular sac rudimentary or absent in males and totally absent in females. Forearm always more than 70 mm. Body hairy, while wings and interfemoral membrane naked. Ears large.

Locality : Reported from Krishnapur in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None.

Habitat : A colonial species inhabiting the caves, old mines, tunnels, temples, ruins near forest or dry scrubland etc.

Distribution : India.

Status : IUCN criteria proposed as per CAMP Report (2002): Vulnerable (National, For *Taphozous theobaldi*).

Source : Brossett (1962a), Corbet and Hill (1992), Wilson and Reeder (1993, 2005); Bates and Harrison (1997) and Alfred *et al.* (2002).

Remarks : Nil

Family MEGADERMATIDAE

Family *Megadermatidae* is represented by two species under the only Genus *Megaderma* in Karnataka State.

Genus ***Megaderma***

Key to the species of the Genus *Megaderma*

– Forearm small (52-63 mm), intermediate nose-leaf broad and posterior termination of the nose-leaf rounded ..... *Megaderma spasma horsfieldii*

– Forearm long (60-71 mm), intermediate nose-leaf narrow and posterior termination of the nose-leaf truncated ..... *Megaderma lyra lyra*

19. ***Megaderma spasma horsfieldii*** Blyth

1863. *Megaderma horsfieldi* Blyth *Cat. Mammal. Mus. Asiat. Soc. Bengal,* p. 23 (India)

2002. *Megaderma spasma horsfieldii* : Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper* No. **199** : 33 (Publ. : Director, Zool. Surv. India).

Common Name : Lesser False Vampire bat.

Diagnostic Characters : A medium sized bat, with large ears, nose-leaf and tragus, but without externally visible tail; dorsal colour bluish slaty, ventral parts paler; forearm 52-63 cm; posterior termination of nose-leaf rounded.

Locality : Reported from Haleri, Honkan, Sirsi, Hulekal, Gersoppa, Talewadi in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None.

Habitat : The species is colonial in habit inhabiting old ruins, houses, temples wells etc.

Distribution : Throughout India.

Status : The distribution of the species is rather patchy and occurrence rare. IUCN Criteria proposed as per CAMP Report (2002) : Least Concern (National).

Source : Brosset (1962b), Cobert and Hill (1992), Wilson and Reeder (1993, 2005), Bates and Harrison (1997), Pradhan and Kurup (2001) and Alfred *et al.* (2002).

Remarks : Nil.

*20. ***Megaderma (Lyroderma) lyra lyra*** Geoffroy

1810. *Megaderma lyra* E. Geoffroy. *Ann. Mag. Hist. Nat. Paris*, **15** : 190.

1997. *Megaderma lyra lyra* : Bates and Harrison, *Bats of Indian Subcontinent* : 51-54.

Common Name : Greater false vampire bat.

Diagnostic Characters : Similar to *Megaderma spasma* but larger in size, forearm 60-70 mm, posterior termination of nose-leaf truncated, dorsal colour slaty grey.

Locality : Reported from Hangal, Honkan, Devikop, Sirsi, Jog falls, Honawar, Kardibetta forest, Sagar, Vijaynagar, Kolar, Seringapatam, Belgaum, Pattadkal, Kasakola, Puttur, Shimoga in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : One specimen collected from Nagarhole National Park, Karnataka State (ZSI,WRC collection M/527).

Habitat : Similar to that of *Megaderma spasma.*

Distribution : Throughout India.

Status : Fairly distributed and common bat

species. IUCN Criteria proposed as per CAMP Report (2002) : Least Concern (National).

Source : Brosset (1962b), Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Bates and Harrison (1997), Pradhan and Kurup (2001) and Alfred *et al.* (2002).

Remarks : Nil.

Family RHINOLOPHIDAE

Family *Rhinolophidae* consists of one modern genus *Rhinolophus* with approximately 60 species throughout the tropics, subtropics and temperate zones of the old world rhinolophid range. These are small to moderate sized bats with forearm ranging in between 30-75 mm and are characterized by a complex nose-leaf. They are insectivorous, catching their prey in flight, and occur in wide variety of habitats from forests to open areas. Some are solitary while others live in moderate groups. Genus *Rhinolophus* is represented by three species in Karnataka State.

Genus ***Rhinolophus***

Genus *Rhinolophus* is represented by three species in Karnataka State.

Key to the species of Genus *Rhinolophus*

1. Base of sella expanded, making trifolium shaped structure, frontal depression very deep, Forearm length in the range between 60-65 mm. ..... *Rhinolophus beddomei*

– Base of sella not expanded, not making any trifolium shaped structure, frontal depression shallow 2

2. Connecting process triangular and pointed and higher than top of the sella forming deep notch between them, forearm length less than 42 mm ..... *Rhinolophus lepidus*

– Connecting process not triangular and pointed and is at the level with top of sella forming a shallow notch between them, forearm length in the range between 44-54 mm .... *Rhinilophus rouxii*

*21. ***Rhinolophus rouxii rouxii*** Temminck

1834. *Rhinolophus rouxii* Temminck, *Monogr. Mammal*, **2** : 306.

2002. *Rhinolophus rouxii rouxii* : Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper* No. **199** : 42.

Common Name : Rufous horse-shoe bat.

Diagnostic Characters : Smaller bat with forearm length in the range between 44-54 mm., base of sella straight but not expanded, connecting process is at the level with top of the sella; colour varies from brown to orange–yellow.

Locality : Reported from Yellapur, Devikop, Potoli, Dandeli, Barchi, Hulekal, Gersoppa, Sirsi, Seringapatnam, Bangalore, Talewadi and Jog falls (Bates and Harrison, 1997).

Material Examined/Sightings : Two specimens collected from Karkal, South Kanara Dist., Karnataka State (ZSI,WRC, Collection M/552).

Habitat : Large caves, rocky outcrops in semi-evergreen forests. It can lead a solitary to colonial life.

Distribution : Throughout India.

Status : IUCN Criteria proposed as per CAMP Report (2002): Near Threatened (National).

Source : Brosset (1962b), Wilson and Reeder (1993, 2005) and Bates and Harrison (1997) and Pradhan and Kurup (2001).

Remarks : Nil.

22. ***Rhinolophus lepidus lepidus*** Blyth

1844. *Rhinolophus lepidus* Blyth, *J. Asiat. Soc. Bengal*, **13** : 486.

2002, *Rhinolophus lepidus lepidus* : Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper* No. **199** : 39.

Common Name : Blyth's horse-shoe bat.

Diagnostic Characters : Smaller horse-shoe bat with forearm less than 42 mm., but with relatively larger ears and nose-leaf, connecting process higher than top of sella forming a deep notch between them.

Locality : Reported from Jog Falls, Gersoppa in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None.

Habitat : Large caves in forested areas, rocky outcrops, semi-evergreen forests. It can lead a solitary to colonial life.

Distribution : Throughout India.

Status : Field survey studies report number of locations in isolated places (CAMP Report, 1998); IUCN Criteria proposed as per CAMP Report (2002) : Least Concern (National).

Source : Brosset (1962b), Corbet and Hill (1992), Wilson and Reeder (1993, 2005) and Bates and Harrison (1997).

Remarks : Nil.

23. ***Rhinolophus beddomei*** Andersen

1905. *Rhinolophus beddomei* Andersen, *Ann. Mag. N. H.,* **16** : 253.

1997. *Rhinolophus beddomei* : Bates and Harrison, *Bats of Indian Subcontinent* : 51-54.

Common Name : Woolly horse-shoe bat.

Diagnostic Characters : Forearm length ranging between 61.0-65.0 mm. Horshoe broad; Sella trifoliate; Vertical part of the sella making a trifolium shaped structure with the top; Connecting process starting slightly below the tip of the sella, sloping towards the posterior noseleaf and forming a triangular structure in lateral view. The lancet is well developed, sub acutely pointed; Fur very long, dense and wooly and usually black with grey tips.

Locality : Reported from Sirsi, Haleri, Halepalya village (Bates and Harrison, 1997).

Material Examined/Sightings : None.

Habitat : This species is restricted to the forested areas at 600-800m altitude; hanging isolated in a secluded corner of some dungeon, cave or old building, deserted wells.

Distribution : Andhra Pradesh, Kerala and Maharashtra (Bates and Harrison, 1997).

Status : IUCN Criteria proposed as per CAMP Report (2002): Near Threatened (National).

Source : Brosset (1962b), Bates and Harrison (1997) and Wilson and Reeder (2005).

Remarks : Nil.

Family HIPPOSIDERIDAE

The family Hipposideridae in Karnataka State is represented by the seven species under only one genus *Hipposideros*. All hipposiderids possess complex noseleaf with its anterior part does not have a median notch. Some species possess lateral supplementary leaflets. The central portion of the nose-leaf is a cushion-like structure.

This family has been treated as a subfamily of Rhinolophidae by Ellerman and Morrison-Scott (1951), Koopman in Wilson and Reeder (1993) and Alfred *et al.* (2002). However, Corbet and Hill (1992), Bates and Harrison (1997), Wilson and Reeder (2005) and Alfred *et al.* (2006a) have considered it as a distinct family on the basis of different forms of noseleaf. Same view has been followed here.

Genus ***Hipposideros***

Genus *Hipposideros* is represented by a seven species/subspecies in Karnataka State.

Key to the species of Genus *Hipposideros*

1. No supplementary leaflet present on each side of horseshoe 2

– Supplementary leaflets present on each side of horseshoe 4

2. Internarial septum thickened and/or bulbous; anterior half of zygoma slender, Forearm length about 37 mm ..... *Hipposideros ater*

– Internarial septum not inflated; anterior half of zygoma massive 3

3. Anterior lower premolar much reduced; posterior projecting portion of vomer blade Like. Forearm Length less than 45 mm ..... *Hipposideros fulvus*

– Anterior lower premolar not reduced; posterior projecting portion of vomer thickened. Forearm Length about 39 mm ..... *Hipposideros pomona*

4. Four supplementary leaflets on each side; forearm length about 90 mm ..... *Hipposideros lankadiva*

– Supplementary leaflets less than four; forearm length about 50 mm 5

5. One supplementary leaflets on each side of horseshoe ..... *Hipposideros hypophyllus*

– Two supplementary leaflets on each side of horseshoe ..... *Hipposideros galeritus*

– Three supplementary leaflets on each side of horseshoe ..... *Hipposideros speoris*

24. ***Hipposideros ater ater*** Templeton

1848. *Hippisideros ater* Templeton, *J. Asiat. Soc. Bengal,* **17**(1) : 252.

1997. *Hippisideros ater ater* : Bates and Harrison, *Bats of Indian Subcontinent* : 81-84.

Common Name : Dusky Leaf-nosed bat.

Diagnostic Characters : Forearm length about 37 mm. Ears small with well-developed antitragus. Noseleaf consists of a horizontal horseshoe with an intermediate leaf and a simple posterior leaf; Posterior leaf comprises four cells and three septa but without vertical process; Anterior leaf of noseleaf without supplementary lateral leaflets; Intermediate leaf simple in form and has a slightly convex upper border. In the wing, 4th metacarpal exceeds the 5th in length; Third metacarpal short. Fur variable in colour from dull yellow to dark brown to pale grey. Jugal bone of each zygoma with dorsal process.

Locality : Reported from Dharwad, Lingasugur, Therhalli, Hanumanhalli in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None.

Habitat : Found in the deep wells, dark hollows in walls, caves and favours highly humid atmosphere.

Distribution : Karnataka, Kerala, Orissa, Tamil Nadu and Maharashtra.

Status : IUCN Criteria proposed as per CAMP Report (2002) : Least Concern (National).

Source : Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Bates and Harrison (1997).

25. ***Hipposideros fulvus fulvus*** Gray

1838. *Hipposideros fulvus* Gray, *Mag. Zool. Bot.*, **2** : 492.

2002. *Hippisideros fulvus fulvus* : Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.* **199** : 47.

Common Name : Fulvous Leaf-nosed bat.

Diagnostic Characters : Ears large, rounded, longer than head, upper part of posterior margin slightly flattened, forearms shorter (less than 45 mm), internarial septum narrow and broadened at the base.

Locality : Reported from Dharwad, Gadag, Honawar, Vijaynagar, Therhalli and Hanumanhalli in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None.

Habitat : Colonial in habit living in ruins of caves, temples, buildings in and near forested areas.

Distribution : Throughout India excluding Jammu and Kashmir.

Status : It has been reported from many localities in India, IUCN Criteria proposed as per CAMP Report (2002) : Least Concern (National).

Source : Brosset (1962b), Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Bates and Harrison (1997) and Pradhan and Kurup (2001).

Remarks : Nil.

26. ***Hipposideros pomona pomona*** Andersen

1918. *Hippisideros pomona* Andersen, *Ann. Mag. Nat. Hist.*, ser. 9, **2** : 380,381.

1997. *Hippisideros pomona pomona* : Bates and Harrison, *Bats of Indian Subcontinent*, 88-90.

Common Name : Anderson's Leaf-nosed Bat.

Diagnostic Characters : A medium sized leaf-nosed bat with forearm length about 39 mm. Dorsal pelage mid to dark brown with pale base; Ventral surface pale throughout. Third metacarpal shorter than fifth.

Locality : Reported from Haleri in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None.

Habitat : The bats were found in the natural, narrow and posterior slanting caves.

Distribution : Southern India.

Status : IUCN Criteria proposed as per CAMP Report (2002) : Least Concern (National).

Source : Bates and Harrison (1997), Pradhan and Kurup (2001) and Alfred *et al.* (2002).

Remarks : Nil.

27. ***Hipposideros hypophyllus*** Kock and Bhat

1994. *Hipposideros hypophyllus* Kock and Bhat, *Senckenberg. Boil.*, **73** : 25.

1997. *Hipposideros hypophyllus*: Bates and Harrison, *Bats of Indian Subcontinent* : 90-91.

Common Name : Leafleted Leaf-nosed bat; Kolar Leaf-nosed bat.

Diagnostic Characters : Small species with forearm length about 40.0 mm. Noseleaf with presence of a single pair of well developed supplementary leaflets; Anterior leaf without a median emargination; Intermediate leaf narrower than the anterior leaf; Posterior leaf is broader than the anterior leaf.

Locality : Reported from Hanumanhalli, Kolar Dist. and Mysore in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None.

Habitat : Roosts in narrow subterranean caves in granite rocks.

Distribution : Endemic to Karnataka, India.

Status : IUCN Criteria proposed as per CAMP Report (2002) : Endangered (National).

Source : Bates and Harrison (1997), Wilson and Reeder (2005) and Alfred *et al.* (2002, 2006a).

Remarks : Nil.

28. ***Hipposideros galeritus brachyotus*** (Dobson)

1874. *Phyllorhina brachyota* Dobson, *J. Asiat. Soc. Bengal,* **43**(2) : 237.

2002. *Hippisideros galeritus brachyotus* : Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.* **199** : 47-48.

Common Name : Cantor's Leaf-nosed bat.

Diagnostic Characters : Medium-small species with forearm length about 48.0 mm. Noseleaf simple, essentially similar to that of *H. ater,* but broader and differing in the presence of two pairs of well developed supplementary lateral leaflets; Anterior leaf without a median emargination; The internarial septum small, triangular shaped and with a narrow base. Nostrils large and well defined, each has a small lappet on its external border; Intermediate leaf simple with a slightly convex superior border; Posterior leaf has three well developed septa which divide it into four discrete cells. Ears broad at the base, triangular in shape and possess concavity below the narrowly rounded off tips on the posterior border. Pelage colour variable in different shades of brown colour with pale base.

Locality : Reported from Badami and Honawar in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None.

Habitat : Isolated populations or small colonies roost in caves, forts, old temples, crack of walls of houses.

Distribution : Andhra Pradesh (Srinivasulu, 2006), Bihar, Gujarat, Karnataka, Madhya Pradesh (Bates and Harrison, 1997).

Status : IUCN Criteria proposed as per CAMP Report (2002) : Near Threatened (National) (For *H. galeritus*).

Source : Brosset (1962b), Corbet and Hill (1992), Wilson and Reeder (1993, 2005) and Bates and Harrison (1997).

Remarks : Nil.

29. ***Hipposideros speoris speoris*** (Schneider)

1800. *Vespertilio speoris* Schneider, In Schreber, J.C.D. *Die sangethiere in Abbildungen nach der Natur Frlangen Supplement* : pl. 59b.

1997. *Hippisideros speoris speoris* : Bates and Harrison, *Bats of Indian Subcontinent* : 93-96.

Common Name : Schneider's leaf-nosed bat.

Diagnostic Characters : Three supplementary leaflets on each side of horseshoe. Forearm larger

(45-57 mm), rostrum flattened, prominent supraorbital ridge present, ears triangular moderately or acutely pointed.

Locality : Reported from Gersoppa, Gadag, Belgaum, Vijaynagar, Lingasugur, Mysore, Honawar, Kolar, Seringapatanam, Sivasamudram, Wotekolli, Hampi, Pattadkal, Badami, Bangalore Therhalli and Hanumanhalli in Karnataka State (Bates and Harrison, 1997 and CAMP Report, 2002).

Material Examined/Sightings : None.

Habitat : Same as *Hipposideros fulvus*.

Distribution : Throughout the Peninsular India.

Status : The species has been reported from many localities in Peninsular India and Sri Lanka; IUCN Criteria proposed as per CAMP Report (2002): Least Concern (National).

Source : Brosset (1962b), Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Bates and Harrison (1997) and Pradhan and Kurup (2001).

Remarks : *Hipposideros speoris pulchelus* Andersen reported from Vijaynagar, Bellary, Karnataka State synonymysed under the subspecies *Hipposideros speoris speoris* (Schneider) by Bates and Harrison (1997) and Wilson and Reeder (2005).

30. *Hipposideros lankadiva indus* (Andersen)

1918. *Hipposideros indus* Andersen, *Annals. Mag. Nat. Hist.*, **2** : 382

1997. *Hipposideros lankadiva indus* (Andersen), Bates & Harrison, *Bats of The Indian Subcontinent*: 99-100.

Common Name: Kelaart's Leaf-nosed bat.

Diagnostic Characters : Large sized Hipposideran bat with an average forearm length about 90 mm. Noseleaf has four supplementary leaflets. Pelage variable, ranges from pale cream to fulvous brown, orange and bright red; Tends to be darker on the forehead, shoulders and on the rump; venter pale.

Locality : Reported from Kolar, Gersoppa, Vijaynagar, Muroor and Talewadi in Karnataka State (Bates and Harrison, 1997).

Material Examine /Sightings : None.

Habitat : Its favoured diurnal roost includes old buildings, caves and tunnels, dilapidated buildings, temples etc.

Distribution Peninsular and NE India.

Elsewhere : Sri Lanka (Bates and Harrison, 1997 and CAMP Report, 2002).

Status : Bates and Harrison (1997) have listed number of collection localities in India; IUCN Criteria proposed as per CAMP Report (2002): Least Concern (National).

Source : Brosset (1962b), Corbet and Hill (1992), Wilson and Reeder (1993), Bates and Harrison (1997) and Pradhan and Kurup (2001).

Remarks : *Hipposideros lankadiva indus* is a high flyer and may be seen in the early evening in the company of *Pipistrellus* spp. It is also known to share the roost with *Taphozous melanopogon* and *Megaderma lyra* (Khajuria and Ghosal, 1981).

Family VESPERTILIONIDAE

Vespertilionid bats possess tragus but no nose-leaf, the tail is approximately as long as the forearm and is enclosed entirely in the interfemoral membrane.

Four subfamilies have been recorded from the Karnataka State.

Key to subfamilies of the family VISPERTILIONIDAE

1. Ears large and funnel shaped ..... KERIVOULINAE
– Ears normal and not funnel shaped 2
2. Second phalanx of third finger very much elongated, nearly three times as long as First ..... MINIOPTERINAE
– Second phalanx of third finger normal and not elongated 3
3. Cheek-teeth six on each side of upper and lower jaw ..... MYOTINAE
– Cheek-teeth less than six on each side of upper and lower jaw ..... VESPERTILIONINAE

Subfamily VESPERTILIONINAE

Five genera under subfamily Vespertilioninae have been reported from Karnataka State.

Key to the genera of the Subfamily VESPERTILIONINAE

1. Greatly enlarged pads on the foot and thumb ..... *Tylonycteris*
– No greatly enlarged pads on the foot and thumb 2
2. Upper premolars 2-2 3
– Upper premolars 1-1 4
3. Second upper incisor (I^3) always present..... ..... *Pipistrellus*
– Second upper incisor (I^3) absent or when present, minute ..... *Scotozous*
4. Upper incisors 1-1 ..... *Scotophilus*
– Upper incisors 2-2 ..... *Hesperoptenus*

Tribe **Eptesicini**

Genus ***Hesperoptenus***

Genus *Hesperoptenus* is represented by a single species, *Hesperoptenus tickelli* (Blyth) in Karnataka State.

31. ***Hesperoptenus tickelli*** (Blyth)

1851a. *Nycticejus tickelli* Blyth, *J. Asiat. Soc. Bengal*, **20** : 157.

1997. *Hesperoptenus tickelli*: Bates and Harrison, *Bats of Indian Subcontinent* : 196-198.

Common Name : Tickell's Bat.

Diagnostic Characters : A rather large-sized (Forearm about 55.0 mm with a range of 50.0-60.4 mm) vespertilionid bat; colour in the shades varying from light grayish yellow to bright golden brown with rufous tinge, head grayish; ears oval; wing membrane blackish; wings from base of the toes; small pad under thumb; second upper incisor small and located at the base of first; muzzle broad and blunt, swollen on sides; crescent-shaped tragus is about half the length of pinna.

Locality : Reported from Dharwar,Yellapur, Astoli, Samasgi, Potoli, Sirsi and Hulekal in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None.

Habitat : Essentially a sub-montane species which may migrate to the plains in suitable season; live singly or in small parties concealing very well amongst the foliage, a known high flyer bat species.

Distribution : Throughout India.

Status : The species has been reported from many localities in India, IUCN Criteria proposed as per the CAMP Report (2002) : Least Concern (National).

Source : Brosset (1962c), Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Bates and Harrison (1997) and Alfred *et al.* (2002).

Remarks : Nil.

Tribe **Nycticeiini**

Genus ***Scotophilus***

Genus *Scotophilus* is represented by two species/subspecies in Karnataka State.

Key to the species and subspecies of the Genus *Scotophilus*

– Size larger, forearm, on average, more than 55.0 mm ..... *Scotophilus heathii heathii*
– Size smaller, forearm, on average, less than 55.0 mm ..... *Scotophilus kuhlii kuhlii*

32. ***Scotophilus heathii heathii*** Horsfield

1831. *Scotophilus heathii* Horesfield, *Proc. Zool. Soc., Lond.* 113.

2002. *Scotophilus heathii heathii*: Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.* **199** : 73-74.

Common Name : Greater Asiatic yellow Bat.

Diagnostic Characters : A robust bat with small transversely ridged ears, rounded at tips, tragus semi-lunar, markedly convex on posterior border, larger in size with forearm more than 55.0 mm. Long tail embodied in interfemoral membrane with terminal end of 2-3mm free. Pelage on back dark

to chestnut brown. Ventral parts lemon-yellow to orange-yellow in colour.

Locality : Reported from Belgaum, Dharwar, Hubli, Malgi, Samasgi, Sirsi, Kolar in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None.

Habitat : Colonial in habit living in old buildings, ruins and trees.

Distribution : Widely distributed in India.

Status : The species has been reported from many localities in India; IUCN Criteria proposed as per the CAMP Report (2002) : Least Concern (National).

Source : Brosset (1962c), Corbet and Hill (1992), Wilson and Reeder (1993, 2005) and Bates and Harrison (1997) and Pradhan and Kurup (2001).

Remarks : Nil.

33. ***Scotophilus kuhlii kuhlii*** Leach

1822. *Scotophilus kuhlii* Leach. *Trans. Linn. Soc. Lond.*, **13** : 723.

2003. *Scotophilus kuhlii kuhlii*: Das, P.K., *Rec. zool. Surv. India, Occ. Paper No.* **217** : 98-99.

Common Name : Lesser Asiatic Yellow Bat.

Diagnostic Characters : Ears small, rounded at tips, tragus semi-lunar, markedly convex on posterior border, Very much similar to the Asiatic greater yellow house bat but smaller in size with forearm less than 55.0 mm. Tip of tail free, fur short and dense, dorsal colour olive-brown, while ventral colour creamy white with tinge of red.

Locality : Reported from Belgaum, Astoli, Dharwar, Samasgi, Sirsi, Hulekal, Kolar, Seringapatam, Haleri, Bangalore in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None.

Habitat : Specimens of this species can lead solitary and or colonial life in the crevices of old buildings and ruins. They also prefer arboreal life.

Distribution : Throughout India.

Status : It has been reported from many localities in India; IUCN Criteria proposed as per the CAMP Report (2002) : Least Concern (National).

Source : Brosset (1962c), Corbet and Hill (1992), Wilson and Reeder (1993, 2005) and Bates and Harrison (1997).

Remarks : Nil.

Tribe **Pipistrellini**

Genus ***Pipistrellus***

The genus *Pipistrellus* is represented by three species/subspecies in Karnataka State.

Key to the species and subspecies of the Genus *Pipistrellus*

1. Size large (forearm 38 mm or more) .... *Pipistrellus ceylonicus indicus*

– Size smaller (forearm less than 38 mm.) ...2

2. Condylocanine length between 10.6 to 11.9 mm and M^3 - M^3 5.0-6.0 mm .... *Pipistrellus coromandra coromandra*

– Condylocanine length between 9.3-10.7 mm and M^3 - M^3 4.5-5.2 mm .... *Pipistrellus tenuis mimus*

34. ***Pipistrellus ceylonicus indicus*** (Dobson)

1878. *Vesperugo indicus* Dobson. *Cat. Chiroptera Br. Mus.* : 222.

2002. *Pipistrellus ceylonicus indicus* : Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.* **199** : 66.

Common Name: Kelaart's Pipsiterelle.

Diagnostic Characters : One of the larger pipistrelle with forearm reaching 40.00 mm, ear short and triangular with outer margin straight, tragus with straight inner end, wings from base of toes, post calcarial lobe semicircular, extreme tip of the tail free from membrane. The subspecies can be easily distinguished externally by the deep brown colour of the body.

Locality : Reported from Mangalore, Gadag, Sirsi, Honawar, Vijayanagar, Bangalore, Seringapatam, Sivasamudram, Mercara, Haleri, Wotekolli, Srimangala, Dharwar, Belary, Jellopur,

Astoli in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None.

Habitat : Colonial in habit living in crevices in wood, building, old ruins, bridges etc. Electic species with colony size ranging from single individual to 200. They do not hang but cling to the surface with the help of feet and wing claws. Most common species.

Distribution : Widely distributed in India.

Status : It has been reported from many localities in India; IUCN Criteria proposed as per the CAMP Report (2002): Least Concern (National).

Source : Brosset (1962c), Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Bates and Harrison (1997) and Pradhan and Kurup (2001).

Remarks : Nil.

35. ***Pipistrellus coromandra coromandra*** (Gray)

1838. *Scotophilus coromandra* Gray, *Mag. Zool. Bot.* **2** : 498.

2002. *Pipistrellus coromandra coromandra*: Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.* **199** : 67.

Common Name : Indian Pipistrelle.

Diagnostic Characters : Small-sized pipistrelle but with forearm around 31 mm, dorsal fur blackish brown, hair tips slightly rufescent, belly paler brown, tragus curved forward and bluntly rounded, small calcarial lobe present.

Locality : Reported from Vijayanagar, Hawsbhavi, Samasgi, Bangalore, Sivasamudram, Dharwar, Hampi, Bellary, Srimangala in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None;

Habitat : Colonial in habit living in crevices of buildings, ruins and bark of trees.

Distribution : Widely distributed in Peninsular India.

Status : It has been reported from many Indian localities; IUCN Criteria proposed as per CAMP Report (2002) : Least Concern (National).

Source : Brosset (1962c), Corbet and Hill (1992), Wilson and Reeder (1993, 2005) and Bates and Harrison (1997) and Pradhan and Kurup (2001).

Remarks : Nil

36. ***Pipistrellus tenuis mimus*** Wroughton

1899. *Pipistrellus mimus* Wroughton *J. Bombay nat. Hist. Soc.*, **12** : 722.

1997. *Pipistrellus tenuis mimus*: Bates and Harrison, *Bats of Indian Subcontinent* : 174-177.

Common Name : Indian Pygmy Pipistrelle.

Diagnostic Characters : Small sized pipistrelle bat with forearm between 25.0 to 32.00 mm; fur dense and short; dorsal coloration bistre brown, ventral parts lighter, ears small and scarcely triangular, tragus short and curved forward, wings from base of toes; Condylocanine length between 9.3-10.7mm. and $M^3 - M^3$ 4.7-5.4 mm.

Locality : Reported from Dharwar, Bellary, Mysore, Astoli, Gadag, Potoli, Barchi, Honawar, Kardibetta Forest, Vijayanagar, Bangalore, Srimangala and Kutta in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None.

Habitat : Both, solitary and colonial in habit preferring to live in crevices of buildings and rocks.

Distribution : Widely distributed throughout India.

Status : It has been reported from many localities in India, IUCN Criteria proposed as per CAMP Report (2002): Least Concern (National, for *Pipistrellus tenuis*).

Source : Brosset (1962c), Corbet and Hill (1992), Wilson and Reeder (1993, 2005) and Bates and Harrison (1997).

Remarks : The name *P. t. mimus* has been retained following remarks of Bates and Harrison (1997) and Sinha (1980, as cited in Bates and Harrison, 1997).

Genus ***Scotozous***

Genus *Scotozous* is represented by a single species *Scotozous dormeri* from Karnataka State.

37. ***Scotozous dormeri*** Dobson

1875. *Scotozous dormeri* Dobson, *Proc. Zool. Soc. Lond.* **1875** : 373.

1997. *Pipistrellus dormeri dormeri* : Bates and Harrison, *Bats of Indian Subcontinent* : 185-187.

Common Name : Dormer's Pipistrelle.

Diagnostic Characters : Medium-sized pipistrelle with forearm around 34 mm (32.7-36.3 mm), tail considerably shorter than head and body. Dorsal fur grayish brown with hair tips almost silvery, belly contrastingly paler brown or lemon yellow in live or freshly killed specimens. Second incisor (I^3) absent or very small when present not extending beyond cingulum of first incisor (I^2).

Locality : Reported from Bellary, Hawsbhavi, Vijayanagar and Dharwar in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None.

Habitat : A gregarious species. Colonial habit with colony size ranging from 2 to 24. It is generally found in the close vicinity or in the midst of human habitations. Roost sites includes holes and crevices of buildings, ruins and bark of large trees.

Distribution : Widely distributed in Peninsular India.

Status : It has been reported from many Indian localities; IUCN Criteria proposed as per CAMP Report (2002) : Least Concern (National, for *Pipistrellus dormeri*).

Source : Brosset (1962c), Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Bates and Harrison (1997) and Pradhan and Kurup (2001).

Remarks : Ellerman and Morrison-Scott (1951) have accommodated *dormeri* under the subgenus *Scotozous* of the genus *Pipistrellus*. Most of the recent workers follow the same view (Brosset, 1962c, Chakraborty, 1983, Bates and Harrison, 1997 and many others). However, Corbet and Hill (1992), Agrawal *et al* (1992), Wilson & Reeder (2005) thought that *dormeri* should have its own genus and kept under genus *Scotozous*. The same view has been followed here.

Tribe **Vespertilionini**

Genus ***Tylonycteris***

Genus *Tylonycteris* is represented by a single species and subspecies *Tylonycteris pachypus aurex* (Thomas) from Karnataka State.

38. ***Tylonycteris pachypus aurex*** (Thomas)

1915. *Tylonycteris aurex* Thomas, *Ann. Mag. N.H.*, **15** : 228.

1997. *Tylonycteris pachypus aurex*: Bates and Harrison, *Bats of Indian Subcontinent* : 174-177.

Common Name : Lesser Bamboo Bat; Club-footed bat.

Diagnostic Characters : Minute bat with an average forearm length 27.6 mm. Head characteristically flattened with the nostrils projecting forward and slightly downward. The sole of the feet and the base of the thumb have broad fleshy circular pads. Ears triangular with broadly rounded tips. Pelage golden brown. Condylocanine length averages 11.0 mm.

Locality : Reported from Belgaum, Astoli, Dharwar, Samasgi, Sirsi, Hulekal, Haleri, Sagar, Kardibetta Forest, Srimangala in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None;

Habitat : Species of heavy tropical forest, especially those associated with extensive areas of bamboo (Bates and Harrison, 1997).

Distribution : Subspecies restricted to Southern India.

Status : It has been reported from many localities in Southern India; IUCN Criteria proposed as per the CAMP Report (2002) : Near Threatened (National, For *Tylonycteris pachypus*).

Source : Brosset (1962c), Corbet and Hill (1992), Wilson and Reeder (1993, 2005) and Bates and Harrison (1997) and Pradhan and Kurup (2001).

Remarks : Nil.

Subfamily MYOTINAE

Genus ***Myotis***

Genus *Myotis* is represented by two species / subspecies in Karnataka State.

Key to the species of the genus *Myotis*

– Medium size bat with forearm length about 45 mm; Condylocanine length above 15 mm .....*Myotis montivagus peytoni*

– Small size bat with forearm length about 39mm; Condylocanine length below 15mm. ..... *Myotis horsfieldii peshwa*

39. ***Myotis horsfieldii peshwa*** (Thomas)

1915. *Leuconoe peshwa* Thomas *J. Bombay nat. Hist. Soc.*, **23** : 610.

2002. *Myotis horsfieldii peshwa* : Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.* **199** : 59.

Common Name : Horsfield's Myotis.

Diagnostic Characters : A small sized vespertilionid bat with forearm about 39 mm (Range 36.5-41.5 mm); Ears naked, dark and with rounded tips, anterior border evenly convex, posterior border concave above and convex below with a well defined notch in the middle. Pelage dark brown almost black on dorsum, ventrally deep brown with grayish tinge near the base of tail; Interfemoral and wing membrane deep chocolate brown. Wings attached to the outer metatarsal of each foot.

Locality : Reported from Kodai in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None.

Habitat : Forested areas near streams, tunnels, dams and irrigation canals.

Distribution : Maharashtra, Madhya Pradesh, Kerala and Tamil Nadu.

Status : The species has been reported from many localities in Peninsular India, IUCN Criteria proposed as per the CAMP Report (2002) : Least Concern (National) (For *Myotis horsfieldii*).

Source : Hill (1976), Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Bates and Harrison (1997) and Alfred *et al.* (2002).

Remarks : Nil.

40. ***Myotis montivagus peytoni*** (Wroughton & Ryley)

1913. *Myotis peytoni* Wroughton and Ryley, *J. Bombay nat. Hist. Soc.*, **22** : 13.

2002. *Myotis montivagus peytoni*: Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.* **199** : 60.

Common Name : Burmese Whiskered Myotis.

Diagnostic Characters : A medium sized vespertilionid bat with forearm about 45 mm (Range 44.7-46.8 mm); Dorsal pelage soft, dark brown with chocolate brown hair tips and blackish roots; Ventrally hair bases dark, tip paler brown to fawn. Ears short and tip bluntly pointed; Anterior surface of the pinna smoothly convex, posterior surface with shallow concavity beneath the tip. Wings attached to the base of the outer phalanx of each foot.

Locality : Reported from Gersoppa Falls in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None.

Habitat : Rocky crevices in forested areas.

Distribution : Maharashtra, Kerala and Andhra Pradesh.

Status : The species has been reported from few localities in Peninsular India, IUCN Criteria proposed as per the CAMP Report (2002) : Vulnerable (National) (For *Myotis montivagus*).

Source : Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Bates and Harrison (1997) and Alfred *et al.* (2002).

Remarks : Nil.

Subfamily MINIOPTERINAE

Subfamily Miniopterinae is represented by a two species and subspecies under the Genus *Miniopterus* from Karnataka State.

Genus ***Miniopterus***

Key to the species and subspecies of the Genus ***Miniopterus***

– Forearm length above 44.0mm; Condylocanine length above 13.0mm; canine more robust .. .. *Miniopterus schreibersii fuliginosa*

– Forearm length below 44.0 mm; Condylocanine length below 13.0 mm; canine more reduced.. *Miniopterus pusillus pusillus*

41. ***Miniopterus schreibersii fuliginosus*** (Hodgson)

1835. *Vespertilio fuligenosa* Hodgson *J. Asiat. Soc. Beng.*, **4** : 700.

2002. *Miniopterus schreibersii fuliginosus* : Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.* **199** : 79-80.

Common Name: Schreiber's Long-fingered bat.

Diagnostic Characters : This is a medium sized vespertilionid bat of the subcontinent with average forearm length of 47.0 mm (Range : 44.7 -49.6 mm). Ears are small, tragus is tall, slender and slightly curved forward at the tip. It is half the height of pinna. The tail, interfemoral membrane and hind limbs are considerably longer. Each wing is characterized by a highly developed second phalanx of the third finger. The third finger (Mean : 38.1 mm, Range: 36.0-40.1 mm) is approximately three times the length of first phalanx. Fur is soft, silky and dark. Dorsal surface is in various shades of brown, while ventral side is slightly paler. Cheeks are naked below the eyes. The body is usually infected with numerous ecto-parasites, especially Nycteribiids. The skull with condylo-canine length with an average of 14.1 mm. (Range : 13.6-14.8 mm) is marked by the inflation of the braincase anteriorly. The rostrum is low and flattened. The second upper incisor (I^3) is flattened. Its cingulum forming a minute postero-external cusp. Upper canine is tall and slender exceeding the second upper premolar in height. The palate is slightly concave.

Locality : Karnataka State (Alfred *et al.*, 2002, 2006a).

Material Examined/Sightings : None.

Habitat : The species is known to occur in hilly and forested country. The colonies are large and situated in caves, caverns and crevices in rocks (Brosset, 1962c). Colony includes thousands of individuals. Brosset (1962c) suggested that there are two types of colonies. However, there only few large colonies in India.

Distribution : Throughout India (Corbet and Hill, 1992).

Status : Bates and Harrison (1997) have reported the species as a common species throughout its extensive range; IUCN Criteria proposed as per the CAMP Report (2002) : Least Concern (National, For *Miniopterus schreibersii*).

Source : Brosset (1962c), Corbet and Hill (1992), Wilson and Reeder (1993, 2005); Bates and Harrison (1997), Pradhan and Kurup (2001) and Alfred *et al.* (2002, 2006a).

Remarks : The individuals of this species are strong and fast flyers and leave their roosts soon after sunset. They do not stay near the roosts but fly directly away in different directions.

42. ***Miniopterus pusillus pusillus*** Dobson

1876. *Miniopterus pusillus* Dobson, *Monogr. Asiatic Chiroptera*, p. 162.

2002. *Miniopterus pusillus pusillus* : Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.* **199** : 79.

Common Name: Small Long-fingered Bat.

Diagnostic Characters : Small vespertilionid bat with forearm length in the range of 39.6- 40.2 mm. The pelage black throughout, sometimes grey on tips. Skull size small as compared to *Miniopterus schereibersii,* condylocanine length in the range of 12.0 – 12.7; Rostrum short and shallow.

Locality : Hubli in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None.

Distribution : Nicobar Islands and Tamil Nadu in India (Bates and Harrison, 1997).

Status : Bates and Harrison (1997) have

reported the species appears that restricted to a relatively few localities in geographically widespread area; IUCN Criteria proposed as per the CAMP Report (2002) : Vulnerable (National); *Source* : Corbet and Hill (1992), Wilson and Reeder (1993, 2005); Bates and Harrison (1997) and Alfred *et al.* (2002, 2006a).

Remarks : Nil.

Subfamily KERIVOULINAE

Subfamily Kerivoulinae is represented by two species and subspecies under the Genus *Kerivoula* from Karnataka State.

Genus ***Kerivoula***

Key to species/subspecies of the genus ***Kerivoula***

- Dorsal pelage bright orange to tawny-red from tips to roots; Interfemoral and wing membranes orange and black; First incisor large and bicuspid..... *Kerivoula picta picta*
- Dorsal pelage mid-to dark brown; Interfemoral and wing membranes uniform brown and semi-translucent; First incisor broad and unicuspid ..... *Kerivoula hardwickii depressa*

43. ***Kerivoula picta picta*** (Pallas)

1767. *Vespertilio pictus* Pallas, *Spicil. Zool.*, **3** : 7.

1997. *Kerivoula picta picta* : Bates and Harrison, *Bats of Indian Subcontinent* : 212-214.

Common Name : Painted bat.

Diagnostic Characters : A medium sized bat with forearm around 35 mm. possessing characteristic colour patterns. Ears large, bluntly pointed with bright orange in colour, wing membrane orange coloured with prominent black markings between fingers. Tragus long and slender, interfemoral membrane with prominent fringe on the posterior margin.

Locality : Reported from Dharwar, Sivasamudram and Malabar Coast in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None;

Habitat : Though the species leads solitary life, it also sometimes, prefers to stay in small groups, the specimens are generally found among plantations near human habitations.

Distribution : Throughout India;

Status : The species has been reported from many localities in India, IUCN Criteria proposed as per the CAMP Report (2002) : Least Concern (National).

Source : Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Bates and Harrison (1997), Pradhan and Kurup (2001) and Alfred *et al.* (2002).

Remarks : Nil.

44. ***Kerivoula hardwickii depressa*** (Miller)

1906. *Kerivoula depressa* Miller, *Proc. Biol. Soc. Washington,* **19** : 64.

1997. *Kerivoula hardwickii depressa* : Bates and Harrison, *Bats of Indian Subcontinent* : 214-216.

Common Name : Hardwicke's Wooly Bat.

Diagnostic Characters : A medium sized bat with forearm around 35 mm. Ears large with rounded tip. Wing and interfemoral membrane are brown and nearly transparent.

Locality : Reported from Kardibetta Forest, Shimoga Dist. in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None;

Habitat : In India, reported from forested area with an altitudinal range of 600-6695 feet.

Distribution : Jammu and Kashmir, Orissa, West Bengal and north-eastern states (Alfred *et al.*, 2006a).

Status : Rare in Karnataka, IUCN Criteria proposed as per the CAMP Report (2002) : Least Concern (National, for *Kerivoula hardwickii*).

Source : Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Bates and Harrison (1997), Pradhan and Kurup (2001) and Alfred *et al.* (2002, 2006a).

Remarks : Wroughton and Ryley (1913) described *Kerivoula crypta* from Karnataka.

Ellerman and Morrison-Scot (1951), Alfred *et al.* (2002) listed it as a valid subspecies of *Kerivoula hardwickii*. However, Bates and Harrison (1997) synonymised *crypta* under *Kerivoula hardwickii depressa* based on relatively flattened braincase and also provisionally referred it as a Indian subspecies. Same view has been followed here.

Family MOLOSSIDAE

Subfamily MOLOSSINAE

Two species under two separate genera of family Molossidae have been reported from Karnataka State

Key to the genera, species/subspecies of the family MOLOSSIDAE

– Medium sized bat with forearm length averages 50.0 mm; Ears not joined by a membrane over forehead .... *Tadarida aegyptiaca thomasi*

– Large sized bat with forearm length averages 65.0 mm; Ears joined by a membrane over forehead ..... *Otomops wroughtoni*

Genus ***Tadarida***

Genus *Tadarida* is represented by a single species/subspecies *Tadarida aegyptiaca thomasi* Wroughton from Karnataka State.

45. ***Tadarida aegyptiaca thomasi*** Wroughton

1919. *Tadarida thomasi* Wroughton *J. Bombay nat. Hist. Soc.,* **26** : 732.

2002. *Tadarida aegyptiaca thomasi*: Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.* **199** : 81.

Common name : Egyptian Free-tailed bat.

Diagnostic Characters : This is a small-sized molossid bat with average forearm length of 48.2 mm (46.0-52.3 mm). Tail stout projecting conspicuously beyond the narrow interfemoral membrane. Muzzle broad and thick. Upper lip is often wrinkled. Ears large, thick, rounded and separated on the forehead. Tragus is small, while antitragus is usually large and well developed. Tuft of hairs present on the dorsal side of the feet. Fur is soft, dense and short. The dorsal surface is dark buffy brown to clove brown, while the ventral parts are paler. The skull with an average condylo-canine length of 17.9 mm (17.1-18.8 mm) is marked by the presence of the unfused premaxillae leaving a larger palatal emargination extending posteriorly beyond incisor roots. Two pairs of lower incisors present.

Locality : Reported from Dharwad and Kolar in Karnataka State (Bates and Harrison, 1997).

Material Examined/Sightings : None.

Habitat : The species has been reported to roost in the crevices/cracks in caves, cliff faces, rocks, boulders, walls and deserted stone buildings etc. A colonial species with size of the colonies varying between single individual to more than thousand individuals (Bates and Harrison (1997).

Distribution : Throughout India (Corbet and Hill, 1992).

Status : Bates and Harrison (1997) have reported the distribution of the species as world-wide with number of colonies in India. As per these authors the status of the species is common and widespread ; IUCN Criteria proposed as per the CAMP Report (2002) : Least Concern (National, For *Tadarida aegyptiaca*).

Source : Brosset (1962c), Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Bates and Harrison (1997) and Pradhan and Kurup (2001).

Remarks : The individuals of this species are strong, swift and high flyers. They fly with their ears facing downwards. They emerge out of their roosts about half an hour after the sunset. They hunt far away from the roosting sites at the height of 31 meters to 77 meters (Bates and Harrison (1997).

Genus ***Otomops***

Genus *Otomops* is represented by a single species *Otomops wroughtoni* (Thomas) from Karnataka State.

*46. ***Otomops wroughtoni*** (Thomas)

1818. *Nyctinomus wroughtoni* Thomas, *J. Bombay nat. Hist. Soc.,* **22** : 87.

2002. *Otomops wroughtoni* : Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.*, **199** : 81.

Common name : Wroughton's Free - tailed Bat or Wroughton's Giant Mastiff Bat.

Diagnostic Characters : This is a large-sized molossid bat with forearm length ranges between 63.0 to 67.0 mm. Dorsal fur rich glossy dark, chocolate brown on crown of head, back and rump with thin white border on each flank. Dull brown on ventral surface. Ears margins dotted with a number of small horny points; tragus minute and triangular in shape. Anterior border o the pinna with well developed extra lobe. Tail stout projecting conspicuously beyond the narrow interfemoral membrane. A small gular sac present in both the sexes..

Locality : Reported from Barapede Cave near Belgaum in Karnataka State (Ramakrishna *et al.*, 2003).

Material Examined/Sightings : Two specimens collected from Barapede cave, Talewadi, Dist. Belgaum, Karnataka State (ZSI,WRC collection M/173 & M/626).

Habitat : This species apparently confined to one diurnal biotope (vast natural cave) situated on a large plateau rising above the thick forest patches at an altitude of 800 meters.

Distribution : None (Alfred *et al.*, 2006a).

Status : Endemic to India. Reported only from type locality (Alfred *et al.*, 2006a, b); IUCN Criteria proposed as per the CAMP Report (2002) : Critically Endangered (National and Global); Indian Wildlife (Protection) Act (1972, as amended up to 2006) Schedule: I Part: I .

Source : Corbet and Hill (1992), Wilson and Reeder (1993, 2005) and Bates and Harrison (1997), Ramakrishna *et al.* (2003) and Alfred *et al.* (2006a,b).

Remarks : Threats to this species are due to human interference, mining, proposed hydroelectric projects, occasional fire in the surrounding grassland habitat etc. (Ramakrishna *et al.*, 2003).

Order PRIMATES

Order Primates is represented by eight arboreal species in Karnataka State. It is characterized by presence of rather primitive limbs with plantigrade (Five) digits, reduced nasal region and small facial region with large forward-facing eyes. All digits bear nails except 2nd and 3rd digits in Family Lorisidae. Hands and feet prehensile. Thumbs of hind feet opposable. Clavicles well developed. Brain large and complex.

Two families in Karnataka State represent order Primates.

Key to the families of the Order PRIMATES

– Claws on 2nd (C2) and/or 3rd (C3) digits of hind feet, otherwise all digits with nails, lower incisors and canine narrow, Tail absent..... ..... LORISIDAE

– No claws at all on any digits, all digits with nails, lower incisors and canine normal, Tail present ..... CERCOPITHECIDAE

Family LORISIDAE

Single species with two subspecies under one genus *Loris* represents the primate family *Lorisidae* in Karnataka State.

Genus *Loris*

Key to the subspecies of the species *Loris lydekkerianus*

– Populations restricted to Western Ghats of India ..... *Loris lydekkerianus malabaricus*

– Populations found in the southern plains of Mysore and Tamil Nadu extending into the Eastern Ghats ....*Loris lydekkerianus lydekkerianus*

47. ***Loris lydekkerianus lydekkerianus*** Cabrera

1908. *Loris lydekkerianus* Cabrera, *Bio. Soc. Esp. H.N. Madrid*, 139.

2003. *Loris lydekkerianus lydekkerianus* : Molur *et al.*, Status of South Asian Primates : C.A.M.P. Workshop Report, 2003. *Zoo Outreach Organization CBSG-South Asia, Coimbatore, India* : 65-69.

Common Name : Gray Slender Loris; Mysore Slender Loris.

Diagnostic Characters : Slender Loris is a small and slender bodied primate of the size of kitten. It has an elongated snout, long and slender limbs, large, round ears and closely set eyes encircled with brown rim. It has a well-developed index finger. Claws on second and third digits of the hind feet present. External tail absent. Body well furred dark gray to brownish in colour with silver tinge on the back. Underparts white or buff.

Locality : Reported from Bangalore, Chamarajnagar, Bilgiri Rangaswamy Temple Wildlife Sanctuary, Kolar, Tumkur dists. in Karnataka (Molur *et al.*, 2003).

Material Examined/Sightings : One specimen displayed in ZSI, WRC Museum was collected from Karnataka State.

Habitat : Slender Loris lives alone or with mate in the dry deciduous forest and scrub jungle.

Distribution : Parts of Andhra Pradesh and Tamil Nadu in South India.

Status : Endemic to India.

Conservation Status : IUCN Criteria proposed as per the CAMP Report (2003) : Near Threatened, Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: I Part: I, CITES: Appendix: II.

Source : Corbet and Hill (1992), Molur *et al.* (2003), Wilson and Reeder (2005) and Alfred *et al.* (2006, b)

Remarks : The species is involved in domestic as well as international trade for Medicinal and experimental purposes (Pradhan, 1997).

48. ***Loris lydekkerianus malabaricus*** Wroughton

1917. *Loris malabaricus* Wroughton, *J. Bombay nat. Hist. Soc.,* **25** : 45

2003. *Loris lydekkerianus malabaricus* : Molur *et al.*, Status of South Asian Primates : C.A.M.P. Workshop Report, 2003. *Zoo Outreach Organization CBSG-South Asia, Coimbatore, India* : 70-75.

Common Name : English: Gray Slender Loris; Malabar Slender Loris.

Diagnostic Characters : Malabar Slender Loris is a small and slender bodied primate of the size of kitten. It has an elongated snout, long and slender limbs, large, round ears and closely set eyes encircled with brown rim. It has a well-developed index finger. Claws on second and third digits of the hind feet present. External tail absent. Body well furred dark gray to reddish brown in colour with silver tinge on the back. Under parts white or buff.

Locality : Reported from Havinakadu Estate, Kutta, South Coorg; Virajpet, Dakshina Kannada Someswara Wildlife Sanctuary in Karnataka (Molur *et al.*, 2003).

Habitat : Slender Loris lives alone or with mate in the moist deciduous, teak plantations and semi-evergreen forests.

Distribution : Parts of Goa, Kerala and Tamil Nadu in Western Ghats India.

Status : Endemic to India.

Conservation Status : IUCN Criteria proposed as per the CAMP Report (2003) : Near Threatened, Indian Wildlife (Protection) Act (1972, as amended up to 2006) Schedule: I Part: I, CITES: Appendix: II.

Source : Corbet and Hill (1992), Molur *et al.* (2003) and Wilson and Reeder (2005).

Remarks : The species is involved in domestic as well as international trade for Medicinal and experimental purposes.

Family CERCOPITHECIDAE

Two subfamilies in Karnataka State represent the primate family *Cercopithedae.*

Key to the subfamilies of Family CERCOPITHECIDAE

– Cheek-pouches present, tail, in general, smaller than head and body, stomach simple, neonatal coat brown in colour ..... CERCOPITHECINAE

– Cheek- pouches absent, tail distinctly longer than head and body, stomach complex, neonatal coat clearly black, gray or golden in colour ..... COLOBINAE

Subfamily CERCOPITHECINAE

Subfamily *Cercopithecinae* is represented by two species viz. *Macaca radiata* and *Macaca silenus* under a single genus, *Macaca*, in Karnataka State.

Genus ***Macaca***

Key to the species of the genus *Macaca*

– Tail long, about 95-140% of the Head and Body length and not tufted terminally ; Mane around the face absent..... *Macaca radiata*

– Tail short, less than 50% of the Head and Body length and tufted terminally; Mane around the face present ..... *Macaca silenus*

*49. ***Macaca radiata*** (Geoffroy)

1812. *Cercocebus radiatus* Geoffroy,E. *Tableau desdquadrumanes Annales Mus. Hist. nat., Paris* : **15** : 157-198.

2008. *Macaca radiata*: Nameer, P. O. *Zoos' Print,* **XXIII** (8) : 2.

Common Name : Bonnet macaque.

Diagnostic Characters : The macaques with cheek pouches, tail normal and without any tuft at terminal end and comparatively longer (95 to 140% head and body) than other macaque species in north India, scalp hairs radial in direction.

Locality : Throughout Karnataka State (Molur *et al.,* 2003).

Material Examined/Sightings : Number of troops were sighted by various ZSI survey parties in Nilgiri Biosphere Reserve.

Habitat : The species is semi-arboreal living in forested, urban, semi-urban, rural etc. areas of south India.

Distribution : Southern peninsular India upto 21° N.

Status : The species has been reported from number of localities in South India, The species is endemic to south India, IUCN Criteria proposed as per the CAMP Report (2003) : Least Concern, Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule : II Part I, CITES : Appendix II.

Source : Prater (1980), Fooden *et. al.* (1981), Corbet and Hill (1992), Pradhan and Kurup (2001), Molur *et al.* (2003) and Wilson and Reeder (2005).

Remarks : The species is involved in domestic as well as international trade (Pradhan,1997).

*50. ***Macaca silenus*** (Linnaeus)

1758. *Simia silenus* Linnaeus, *Syst. Nat.* 10th Ed. **1** : 26

2008. *Macaca silenus*: Nameer, P.O. *Zoos' Print,* **XXIII** (8) : 2.

Common Name : Lion-tailed macaque.

Diagnostic Characters : A medium sized macaque with head and Body length 508-610 mm in males and 415-581mm in females. Pelage glossy black with brownish grey mane around the face. A short tufted tail present.

Locality : Kerekatte area in Kudremukh National Park (Palot and Radhakrishnan, 2007), Dakshin Kannada, Mookambika Wildlife Sanctuary, Hassan, Bramhagiri Wildlife Sanctuary, Pushpagiri Wildlife Sanctuary, Thalakaveri Wildlife Sanctuary, Shimoga, Sharavati Wildlife Sanctuary in Karnataka State (Molur *et al.,* 2003).

Material Examined/Sightings : Troops of Lion-tailed macaque were sighted in Western Ghats part of Karnataka State by ZSI survey parties.

Habitat : Dense evergreen or semi-evergreen rainforests in secluded and in frequented areas between 600-1600m. altitudes.

Distribution : Kerala and Tamil Nadu.

Status : The species is endemic to south India, IUCN Criteria proposed as per the CAMP Report (2003) : Endangered, Indian Wildlife (Protection) Act (1972, as amended up to 2006) Schedule : I Part I, CITES : Appendix I.

Source : Prater (1980), Corbet and Hill (1992), Pradhan and Kurup (2001), Molur *et al.* (2003) and Wilson and Reeder (2005) and Alfred *et. al.* (2006b).

Remarks : The species is involved in domestic as well as international trade.

Subfamily COLOBINE

Subfamily *Colobinae* is represented by two genera in Karnataka State.

Key to the genera of the subfamily COLOBINAE

– Dorsum brown ; Venter white pale brown .. .. *Semnopithecus*

– Dorsum black, frosted on rump ; Venter black ..... *Trachypithecus*

Genus ***Semnopithecus***

Genus *Semnopithecus* is represeted by four species in Karnataka State.

Key to the species of the genus *Semnopithecus*

– Tail loop forward 1

– Tail loop backward 2

1 Hands only dark, body colour Golden Grey ..... *Semnopithecus anchises*

– Hands and feet, both, dark ; body colour Greyish-White ..... *Semnopithecus achates*

2 Hands only dark, body colour Grey .... *Semnopithecus priam*

– Arms and Hands dark, body colour Greyish Brown /Black ..... *Semnopithecus hypoleucos*

*51. ***Semnopithecus achates*** (Pocock)

1928. *Pithecus entellus achates* Pocock, *J. Bombay nat. Hist. Soc.*, **32** : 488.

2008. *Semnopithecus achates*: Nameer, P. O. *Zoos' Print*, **XXIII** (8) : 2.

Common Name : Western Hanuman langur.

Diagnostic Characters : A large black faced, gray bodied langur with long limbs, tail longer than head and body and loop forward, whiskers short partly covering the ears. Crown of head little paler than nape and shoulders. Hands and feet black or brown in colour strongly contrasting with that of arms and legs.

Locality : Reported from Devikop, Samasgi, Dharwar, Alnavar, Havasbhavi, Mysore and Kodagu; Uttara Kannada (Molur *et al.*, 2003).

Habitat : Arboreal and colonial in habit living in troops, in Tropical dry and moist deciduous, semi-arid, open scrub, woodland, urban, semi-urban and rural areas near human habitations.

Distribution : Andhra Pradesh, Goa, Gujarat, Madhya Pradesh, Maharashtra, New Delhi, Rajasthan, Tamil Nadu, Uttar Pradesh and Uttaranchal in India.

Status : Endemic to India; IUCN criteria proposed as per CAMP Report (2003) : Least Concern (For *Semnopithecus entellus achates* (Pocock)), Indian wildlife (Protection) Act (1972, as amended up to 2006): Schedule II Part I (For *Semnopithecus entellus*) ; CITES : Appendix I.

Source : Prater (1980), Corbet and Hill (1992), Agrawal *et. al.* (1992), Molur *et al.*, (2003), Wilson and Reeder (2005) and Nameer (2008).

Remarks : The species is involved in domestic as well as international trade. The species is also known to be worshipped by Hindus. Napier (1985) reviewed the taxonomy of the species under Subfamily *Colobinae* and separated previously known *Presbytis entellus* as *Semnopithecus entellus* on the basis Head and Body and Tail length and colour of Neonatal coat. However, Brandon-Jones *et al.* (2002) in Molur *et al.* (2005) named the Karnataka population of above mentioned localities, under the subspecies, *Semnopithecus entellus achates* (Pocock) which needs further taxonomic confirmation. Recently Wilson and Reeder (2005) synonymised *achates* under the species *Semnopithecus dussumieri* (Geoffroy). However, Nameer (2008) listed this subspecies as a separate species *Semnopithecus achates*.

*52. ***Semnopithecus anchises*** Blyth

1844. *Presbytis anchises* Blyth *J. Asiat. Soc. Bengal*, **13** : 470.

2008. *Semnopithecus anchises*: Nameer, P.O. *Zoos' Print*, **XXIII** (8) : 2.

Common Name : Deccan Hanuman langur.

Diagnostic Characters : A large black faced, golden grey bodied langur with long limbs, tail longer than head and body and loop forward,

whiskers short partly covering the ears. Crown of head little paler than nape and shoulders. Hands only black or brown in colour strongly contrasting with that of arms.

Locality : Reported from Raichur in Karnataka (Molur *et al.,* 2003).

Habitat : Tropical dry deciduous forest, forest fringes, near human settlements.

Distribution : Andhra Pradesh, Gujarat, Madhya Pradesh and Maharashtra.

Status : Endemic to India; IUCN criteria proposed as per CAMP Report (2003) : Near Threatened (For *Semnopithecus entellus anchises* Blyth), Indian wildlife (Protection) Act (1972, as amended up to 2006): Schedule II Part I (For *Semnopithecus entellus*); CITES : Appendix I.

Source : Prater (1980), Corbet and Hill (1992), Molur *et al.,* (2003), Wilson and Reeder (2005) and Nameer (2008).

Remarks : The species is involved in domestic as well as international trade. The species is also known to be worshipped by Hindus. Wilson and Reeder (2005) synonymised this species under *Semnopithecus dussumieri* (Geoffroy). However, Nameer (2008), recently, listed this subspecies as a separate species *Semnopithecus anchises.*

*53. ***Semnopithecus hypoleucos*** Blyth

1841. *Semnopithecus hypoleucos* Blyth *J. Asiat. Soc. Bengal,* **10** : 839.

2008. *Semnopithecus hypoleucos* : Nameer, P. O. *Zoos' Print,* **XXIII** (8) : 2.

Common Name : Black/Dark footed Malabar Gray Langur.

Diagnostic Characters : A large black faced, grayish brown/black bodied langur with long limbs, tail with backward loop longer than head and body, whiskers short partly covering the ears. Crown of head little paler than nape and shoulders. Arms and hands black or brown in colour.

Locality : Reported from Makut, Coorg, Brahmagiri Wildlife Sanctuary, Kudremukh National Park, Pushpagiri Wildlife Sanctuary, Wotekolli, Shimoga, Jog falls, Sharavathi valley Wildlife Sanctuary, Uttara Kannada, Karwar in Karnataka (Molur *et al.,* 2003).

Habitat : Tropical rain forest, dry deciduous forest, sacred groves, moist deciduous forest, gardens and riparian forest.

Distribution : Goa and Kerala.

Status : Endemic to India; IUCN criteria proposed as per CAMP Report (2003) : Endangered (For *Semnopithecus entellus hypoleucos* Blyth), Indian wildlife (Protection) Act (1972, as amended upto 2006): Schedule II Part I (For *Semnopithecus entellus*) ; CITES : Appendix I;

Source : Prater (1980), Corbet and Hill (1992), Molur *et al.,* (2003), Wilson and Reeder (2005) and Nameer (2008).

Remarks : The species is involved in domestic as well as international trade. The species is also known to be worshipped by Hindus. Ellerman and Morrison-Scot (1951) and Napier (1985) recognized this population as the subspecies *Presbytis entellus hypoleucos.* Investigations by Brandon-Jones (2004) reveal that *S. e. hypoleucos* population is a part of *S.e. dussumieri,* but because of Law of priority, *S.e. hypoleucos* is considered as the senior synonym of *S.e. dussumieri.* Wilson and Reeder (2005) and Nameer (2008) have considered it as an independent species, *Semnopithecus hypoleucos* Blyth.

*54. ***Semnopithecus priam*** Blyth

1844. *Semnopithecus priam* Blyth *J. Asiat. Soc. Bengal,* **13** : 470.

2008. *Semnopithecus priam*: Nameer, P.O. *Zoos' Print,* **XXIII** (8) : 2.

Common Name : Tufted Gray or Coromandel Langur.

Diagnostic Characters : A large black faced, gray bodied langur with long limbs, tail with backward loop longer than head and body, whiskers short partly covering the ears. Crown of head little paler than nape and shoulders. Hands

only black or brown in colour strongly contrasting with that of arms.

Locality : Reported from Sivasamudram, Bandipur Wildlife Sanctuary, Honnametti Estate, Coorg in Karnataka State (Molur *et al.,* 2003).

Habitat : Tropical rain forest, dry deciduous forest, sacred groves, moist deciduous forest, gardens and riparian forest.

Distribution : Andhra Pradesh, Kerala , Tamil Nadu.

Elsewhere : Sri Lanka.

Status : IUCN criteria proposed as per CAMP Report (2003) : Vulnerable (For *Semnopithecus priam priam* Blyth), Indian wildlife (Protection) Act (1972, as amended upto 2006): Schedule II Part I (For *Semnopithecus entellus*); CITES : Appendix I;

Source : Prater (1980), Corbet and Hill (1992), Molur *et al.,* (2003), Wilson and Reeder (2005) and Nameer (2008).

Remarks : The species is involved in domestic as well as international trade. The species is also known to be worshipped by Hindus. Ellerman and Morrison-Scott (1951) recognized this species as the subspecies *Presbytis entellus priam.* Groves (2001) recognized it as a separate species under the genus *Semnopithecus.* Wilson and Reeder (2005) and Nameer (2008) followed the same.

Genus ***Trachypithecus***

*55. ***Trachypithecus johnii*** (Fischer)

1829. *Cercopithecus johnii* Fischer, *Synopsis Mamm.* P. 25.

2008. *Trachypithecus johnii*: Nameer, P.O. *Zoos' Print,* XXIII (8) : 2.

Common Name : Nilgiri Langur.

Diagnostic Characters : Large-sized langur with head and body length in the range of 508-700mm in male and 550-600mm in female; Tail long about 680-965 in male and 720-800 in female (Alfred and Chakraborty, 2002). Pelage glossy black but back of head covered with long yellowish brown hairs. Rump and base of tail grizzled. Females with a white patch on the inner side of thighs.

Locality : Reported from Machchur, Kodagu, Bramhagiri Wildlife Sanctuary, Srimangala in Karnataka State (Molur *et al.,* 2003).

Habitat : Tropical moist evergreen and moist deciduous forests between 150-2500 m.

Distribution : Kerala and Tamil Nadu.

Status : Endemic to India; IUCN criteria proposed as per CAMP Report (2003) : Vulnerable, Indian wildlife (Protection) Act (1972, as amended upto 2002): Schedule I Part I ; CITES : Appendix II.

Source : Prater (1980), Corbet and Hill (1992), Molur *et al.,* (2003), Wilson and Reeder (2005) and Nameer (2008).

Remarks : The species is involved in domestic as well as international trade.

Order CARNIVORA

All hairy animals possessing limbs with sharp and flat claws and six small, equal-sized incisors, a pair of large, conical canines, and last upper premolar and first lower molar having sharp-edged lobes for shearing the flesh belong to the order *Carnivora.*

Seven families of Order CARNIVORA occur in Karnataka State.

Key to the families of Order CARNIVORA

1. Ethmo-turbinals very large, covering greater part of nasal chambers, extending anteriorly to the anterior orifice; auditory bulla composed of two bones; Cowper's gland absent 2

– Ethmo-trubinals excluded from the anterior orifice of nasal chamber by a large maxillo-turbinals, auditory bulla composed of a single bone; Cowper's gland present 5

2. Posterior palatal foramina set far back on the maxillo-palatine suture; teeth highly sectorial and reduced in number; dental formula 3, 1, 3 or 2, 1/3, 1,2, 1; inter-ramal tuft of vibrissae absent ..... FELIDAE

– Posterior palatal foramina located in front of the maxillo-palatine suture; teeth not so specialized or reduced in number; dental formula 3,1,4 or 2,1/3, 1,4or 3,2 or 1; inter-ramal tuft of vibrissae present 3

3. Four toes in fore and hind feet, dog-like in structure ears lacking any marginal bursa; auditory bulla without oblique groove; massive jaws and teeth, hind quarters week .... HYAENIDAE

– Four or five toes in fore and hind feet; not dog-like in structure; ears having bursa on the margin; auditory bulla distinctly grooved; jaws and teeth not powerful and hind quarters normal and proportionate 4

4. Ears moderate in size, with well-developed bursa and simple supratragus, but devoid of a valvular flap over it; feet compact with short claws; anus not enclosed in a glandular sac; no bony tube to auditory orifice .... VIVERRIDAE

– Ears small and rounded with vestigial bursa, valvular supratragus and a valvular flap over it; feet with free digits and fossorial claws; anus enclosed in a glandular pouch; a well-developed bony tube to the auditory orifice ..... HERPESTIDAE

5. Legs long, slender and digitigrades; fourth digit of forefoot raised above the planter pad; hind-foot with only 4 toes; baculum deeply channeled below ..... CANIDAE

– Legs relatively shortened thick, plantigrade or semi-plantigrade; first digit of the forefoot present close to second; and not raised above the plantar pad; baculum not deeply channeled below 6

6. Large-sized animals with a short tail; pads of digits forming a weak curved line; planter pads very wide; three lower molars on each side ..... URSIDAE

– Small sized animals with a moderately long tail; pads of digits forming a strongly curved line; two lower molars present on each side ..... MUSTELIDAE

Suborder FELIFORMIA

Family FELIDAE

Felids (cats) possess short muzzle ($1/5^{th}$ of total skull length), tooth row of lower jaw with conspicuous gap behind canines, only 3-4 teeth behind the canines in each jaw, no scent glands above anus.

Family Felidae is represented by two subfamilies, FELINAE and PANTHERINAE in Karnataka State.

Key to the Subfamilies of Family FELIDAE

– Small cats with head-body length in the range 40-75 cm; hairs on nape normal and pupil vertical ..... FELINAE

– Large cats with head-body length in the range of 107-200 cm; hairs on nape reversed and pupil Round ..... PANTHERINAE

Subfamily FELINAE

Subfamily Felinae is represented by two Genera, *Felis* and *Prionailurus* in Karnataka State.

– Ears without white patch on the backside, hairs on throat normal and post orbital bar usually incomplete ..... *Felis*

– Ears with white patch on the backside, hairs on throat reversed and post orbital bar complete ..... *Prionailurus*

Genus ***Felis***

Genus *Felis* is represented by a single subspecies under the species, *Felis chaus* in Karnataka State.

*56. ***Felis chaus kelaarti*** Pocock

1939. *Felis chaus kelaarti* Pocock, *Fauna Brit. India, Mamm.* **I** : 300.

1992. *Felis chaus kelaarti* : Corbet and Hill, *The Mammals of the Indomalayan region*: 221.

Common Name : Jungle Cat.

Diagnostic Characters : A medium-sized cat

with long legs and comparatively short tail, head and body length varying between 64-72 cm, belly faintly spotted, tail and legs banded, sometimes winter coat large and luxuriant.

Locality : Sighted in Nagarhole National Park, by ZSI survey parties (Pradhan and Kurup, 2001). Throughout Karnataka State (Kumara and Singh, 2007).

Habitat : Terrestrial, nocturnal, inhabiting drier and open parts of the country, keeping more to grassland, scrub, dry deciduous and evergreen forests, reedy banks of rivers and marshes.

Distribution : South India (South of the Krishna River) and Sri Lanka (Ellerman and Morrison-Scot, 1951).

Status : Most Common, IUCN Criteria proposed as per CAMP Report (1998) : Lower risk-near threatened (National) and Data Deficient (Global); CITES : Appendix II, Indian Wildlife (Protection) Act 1972 (as amended upto 2006) : Schedule : Schedule II Part II.

Source : Agrawal (1972), Corbet and Hill (1992), (Pradhan and Kurup, 2001), Alfred *et al.* (2002, 2006b) and Wilson and Reeder (2005).

Remarks : The population is under threat due to illicit wildlife trade in domestic as well as International markets (Pradhan, 1997).

Genus ***Prionailurus***

Genus *Prionailurus* is represented by three species in Karnataka State.

Key to the species of *Prionailurus*

1. Medium sized cat with Head and Body length above 61cm; Skull length above 123 mm with long sagital crest ..... *Prionailurus viverrinus*

– Small sized cats with Head and Body length below 61cm; skull length below 123 mm with short or absence of sagital crest 2

2. Pelage spotted all over. Tail spotted only on dorsal side. Back of ears black with a pale or whitish spot in the centre. Upper molar series 4 on each side ..... *Prionailurus bengalensis*

– Pelage spotted all over. However tail unspotted. Back of ears brown with a large pale spot in the centre. Upper molar series 3 on each side ..... *Prionailurus rubigenosus*

57. ***Prionailurus bengalensis*** (Kerr)

1792. *Felis bengalensis* Kerr, Anim. Kingd. : 151.

2008. *Prionailurus bengalensis* : Nameer, P.O., Zoos' Print, **XXIII** (8) : 8.

Common Name : Leopard Cat.

Diagnostic Characters : Leopard cat is a carnivore with six small, equal-sized incisors and a pair of comparatively short and conical canines with normal post-canine space. Being member of the cat family which contains beasts of preys, leopard cat shows all typical characters of the order Carnivora and family Felidae. Leopard cat is a relatively small cat with long limbs; Head and Body length 61-66 cm; tail more than half of head and body length (Approx. 60%) and pelage with beautifully ornamented leopard like blackish brown spots. In colour and markings the leopard cat looks like a panther in miniature. The colour of the body is yellowish above and white below. Back of the ears black with round whitish spot in centre. Among other markings, there are four more or less distinct black bands running from the crown over the neck and break up into short bars and elongated spots on the shoulders. There is a pair of horizontal cheek stripes, the lower one joining the black bar across the throat. There are two black bars on the inside of the forearm. The spots on the tail form cross bars towards its end. Hairs on nape normal while reversed on throat. Contracted pupil vertical. Teeth sectorial and reduced in number and are specialized in nature suited to the diet of meat.

Locality : Found to occur along the forests of the Western Ghats, and also adjacent deciduous forests. Reported from Sharavathi Wildlife Sanctuary, Bandipur National Park, Talakavari Wildlife Sanctuary, Pushpagiri Wildlife Sanctuary, Bramhagiri Wildlife Sanctuary in Karnataka State (Karanth, 1986; Kumara and Singh, 2007).

Habitat : Largely terrestrial, semi-arboreal and

nocturnal in habit and, hence, seldom seen; Prefers to live chiefly in thick dry/ moist deciduous and evergreen forests, grasslands, scrubs etc. The prey species mostly include small animals and birds.

Distribution : Throughout India.

Status : IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Near threatened (National) and Data Deficient (Global); Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule : Schedule I Part I, CITES: Appendix : I; Red Data Book (National, 1994): Vulnerable.

Source : Karanth (1986), Corbet and Hill (1992), Chakrborty and Agrawal (2000), Alfred *et al.* (2002, 2006b), Wilson and Reeder (2005), Kumara and Singh (2007) and Nameer (2008).

Remarks : Leopard cat is also killed for fur and body parts for local and domestic trade. Some tribal kill them for preparation of trophies. These beautiful cats are also trapped live for commercial trade (Pradhan, 1997). Earlier *Prionailurus* was synonymies in Genus *Felis*. However most of the taxonomists have chosen to emphasize their distinctiveness by placing them in monotypic genus.

58. ***Prionailurus rubiginosus rubiginosus*** (Geoffroy)

1831. *Prionailurus rubiginosa* Geoffroy, *Belanger, Voy. Ind. Orient. Zool.* 140.

2008. *Prionailurus rubiginosus* : Nameer, P. O., Zoos' Print, **XXIII** (8) : 8.

Common Name: Rusty spotted cat.

Diagnostic Characters : Small sized cat with Head & Body varying in the range of 40-50 cm in length, Dorsal pelage rufescent grey patterned with brown bars and spots. Ground colour grey-brown. Ears with white patch on the backside, hairs on throat reversed. Pair of cheek stripe and four dark lines present over the head. Belly and inner side of legs white with large dark spots. Tail unspotted and uniformly coloured.

Locality : Reported from Nagarhole National Park, Bandipur National Park, Nugu Wildlife Sanctuary, Tumkur and Bangalore (Karanth, 1986; Kumara and Singh, 2007) in Karnataka State.

Habitat : Terrestrial and to some extent arboreal, nocturnal, frequenting grassland, scrub, dry and open forests and tolerant to man-modified habitats like plantations.

Distribution : Peninsular India.

Status : Though very rare, the species has a very wide range of distribution, IUCN Criteria proposed as per CAMP Report (1998) : Lower risk-near threatened (National) and Data Deficient (Global), Indian Wildlife (Protection) Act 1972 (as amended upto 2006) : Schedule I Part I, CITES : Appendix I, Red Data Book (1994) : Insufficiently known.

Source : Corbet and Hill (1992), Chakrborty and Agrawal (2000), Alfred *et al.* (2002, 2006b), Wilson and Reeder (2005), Kumara and Singh (2007) and Nameer (2008).

59. ***Prionailurus viverrinus*** Bennett

1833. *Felis viverrinus* Bennett, *Proc. Zool. Soc. Lond.* 68.

2008. *Prionailurus viverrinus*: Nameer, P.O., Zoos' Print, **XXIII** (8) : 8.

Common Name: Fishing Cat.

Diagnostic Characters : Medium sized harsh coated cat with Head & Body varying between 60-75 cm in length; Tail short about one-third the length of Head and Body; Dorsal pelage tawny grey to brownish mouse grey in colour; Body markings consisting of a series of elongate spots, arranged in longitudinal rows; 6-8 black lines running from forehead to neck; A pair of cheek strikes also present; Skull length in the range of 123-151mm. with long sagittal crest; Nasals very narrow behind.

Locality : Occurrence of this species reported earlier from some coastal districts of Karnataka State (Prater, 1980; Karanth, 1986; Kumara and Singh, 2007).

Habitat : Usually found near water, prefers reed beds and marshy banks of rivers, lakes and back waters; Nocturnal in habit; preys on fishes, tortoises, monitor lizards and small mammals.

Distribution : Andhra Pradesh, Assam, Kerala, Maharashtra, Orissa, Tamil Nadu, Uttar Pradesh, West Bengal.

Elsewhere : Bangla Desh, China, Indonesia, Malaysia, Myanmar, Nepal, Pakistan, Sri Lanka, Taiwan, Thailand and Vietnam.

Status : Rare, IUCN Criteria proposed as per CAMP Report (1998) : Vulnerable (National) and Data Deficient (Global), Indian Wildlife (Protection) Act 1972 (as amended upto 2002) : Schedule I Part I, CITES : Appendix I, Red Data Book (1994) : Insufficiently known.

Source : Corbet and Hill (1992), Alfred *et al.* (2002, 2006b), Wilson and Reeder (2005), Kumara and Singh (2007) and Nameer (2008).

Subfamily PANTHERINAE

Subfamily *Pantherinae* is represented by a single Genus, *Panthera* in Karnataka State.

Genus ***Panthera***

Two species of Genus *Panthera* are known to occur in Karnataka State.

Key to the two species of *Panthera*

– Large sized cats with body length including tail over 260 cm. Colour pattern consisting of vertical black stripes on rich reddish yellow to orange rufous coat .... *Panthera tigris tigris*

– Smaller sized cats with body length including tail Less than 215 cm. Colour pattern consisting of black spots irregularly arranged in rosettes. Tail relatively slim .... *Panthera pardus fusca*

*60. ***Panthera pardus fusca*** (Meyer)

1794. *Felis fusca* Meyer, *Zool. Ann.*: **1** : 394.

2002. *Panthera pardus fusca*, Alfred, Sinha, Chakraborty, Checklist of Mammals of India, *Rec. zool. Surv. Occ. Paper No.*, **199** : 104.

Common Name : Panther/Leopard.

Diagnostic Characters : Leopard/panther is a relatively large cat with long limbs; total length including tail 170-215 cm with height at shoulder 60 cm; tail more than half of head and body length (Approx. 60%) and pelage with beautifully ornamented close-set black spots arranged in rosettes on the short haired coat. The ground colour of the body is yellow above and white below with black rosettes all around. Dorsal ground colour may vary from pale yellow to warm grey, rich tawny to rufous fawn. The tail is covered with spots except at the tip, which is ringed. Hairs on nape and throat reversed. Ears not tufted. Contracted pupils round. Teeth sectorial and reduced in number and are specialized in nature suited to the diet of meat. Claws retractile and especially adapted to strike and hold struggling prey and teeth specially designed to bite into, cut up and tear flesh.

Locality : Sighted at Nagarhole, Bandipur National Parks by ZSI survey parties during surveys (Pradhan and Kurup, 2001).

Habitat : Terrestrial, nocturnal, semi-arboreal, inhabiting forests, scrub jungles, open country etc. They are able to thrive almost anywhere. A resident species not restricted to forests and heavy covers like tiger. Being bold in nature this predator species comes more frequently in contact with man than the tiger.

Distribution : Throughout India.

Status : The species has been reported from number of localities, IUCN Criteria proposed as per CAMP Report (1998) : Vulnerable (National) and Data Deficient (Global), Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule : Schedule I Part I, CITES : Appendix I, Red Data Book (1994): Vulnerable.

Source : Prater (1980), Corbet and Hill (1992), (Pradhan and Kurup, 2001), Alfred *et al.* (2002, 2006b), Menon (2003) and Wilson and Reeder (2005).

Remarks : Largest number of leopard skins in the cat skin trade are involved in the illegal trade. The populations are under threat due to illicit wildlife trade of its fur and body parts in domestic and international markets (Pradhan, 1997).

*61. ***Panthera tigris tigris*** (Linn.)

1758. *Felis tigris* Linnaeus, *Syst. Nat.*: **10th Ed.** : 41.

2002. *Panthera tigris tigris*, Alfred, Sinha, Chakraborty, Checklist of Mammals of India, *Rec. zool. Surv. Occ. Paper No.,* **199** : 104-105.

Common Name : Royal Bengal Tiger/Tiger.

Diagnostic Characters : Tiger, being member of a cat family, which contains beasts of preys, shows all typical characters of order *Carnivora* and family Felidae. Tiger is a large cat with graceful built and long limbs; total length including tail 260-290 cm with black ringed tail more than half of head and body length (Approx. 60%); pelage with beautifully ornamented black coloured stripes on the short haired coat. The ground colour of the body varies from reddish yellow to orange rufous above and white below with black prominent stripes all over the body. Hairs on nape and throat reversed. Ears not tufted but are black on the outer side with a prominent white spot in the middle. Contracted pupils round. Teeth sectorial and reduced in number and are specialized in nature suited to the diet of meat. Claws retractile and especially adapted to strike and hold struggling prey and teeth specially designed to bite into, cut up and tear flesh.

Locality : Sighting of tiger in Nagarhole National Park during surveys reported by ZSI survey parties (Pradhan and Kurup, 2001), Bandipur, Nagarhole, Bhadra, Kudremukh National Parks in Karnataka State (Karanth, 1986; Pradhan and Kurup, 2001; Palot and Radhakrishnan, 2007).

Habitat : Largely terrestrial and nocturnal in habit and, hence, seldom seen; It can live in a variety of habitats like the hills, plains, thick dry/ moist deciduous and evergreen forests, grasslands, scrubs, mangroves swamps etc. Comparatively tiger is a shy animal in behavior. Tiger is a very good swimmer and enormously powerful animal which can easily kill animals larger in size than its own size like bull, cow, bullock etc. In forests it lives on deer, sambar, nilgai, pig, antelope, hare, monkey, peafowl and other small birds. The prey species also include poultry, goat, sheep, dog and even human being on the village border. Tiger hunts between sunset and dawn and covers long distances in the course of night in search of food. Like any large cat it also shows territorial behavior.

Distribution : Throughout India except North-Western region.

Status : IUCN Criteria proposed as per the CAMP Report (1998) : Endangered (National) and Data Deficient (Global); Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule : Schedule I Part I, CITES: Appendix : I; Red Data Book (National, 1994): Vulnerable.

Source : Karanth (1986), Corbet and Hill (1992), Pradhan and Kurup (2001); Alfred *et al.* (2002, 2006b), Menon (2003) and Wilson and Reeder (2005).

Remarks : Large number of tiger skins in the cat skin trade is involved in the illegal trade. Tiger is also killed for fur and body parts trade in domestic as well as international market for various reasons. These beautiful cats are also trapped live for commercial trade (Pradhan, 1997).

Family VIVERRIDAE

Viverrids, are medium sized carnivores, many of them are arboreal with rather unspecialized dentition and omnivorous diet. Most species have a prominent perineal scent gland situated in front of the anus.

Family *Viverridae* is represented by three genera under two subfamilies, *Paradoxurinae* and *Viverrinae* in Karnataka state.

Key to the Subfamilies of Family VIVERRIDAE

– Feet ordinary and digitigrades, carpal pad single, metatarsal pads absent, a definite pattern of dorsal spots present, tail with dark and pale alternate bands ..... VIVERRINAE

– Feet scansorial and semi-plantigrade, semi arboreal, carpal and metatarsal pads double, a pattern of dorsal stripes and lateral spots

present at least in new coat. Tail without any bands and uniformly dark in colour .... PARADOXURINAE

Subfamily PARADOXURINAE

Subfamily *Paradoxurinae* is represented by two species under under Genus *Paradoxurus* in Karnataka State.

Key to the species of the genus *Paradoxurus*

– Body colour Black or blackish brown; Hair on neck normal; Palatal foramina short in the range of 4.6-5.6 mm ....*Paradoxurus hermaphroditus*

– Body colour grizzled brown; Hair on neck reversed in direction; Palatal foramina long in the range of 7.0-9.6 mm ....*Paradoxurus jerdoni*

*62. ***Paradoxurus h. hermaphroditus*** (Pallas)

1777. *Viverra hermaphrodita* Pallas, *In* Schreber, *Die Saugethiere*, **3**: 426.

2002. *Paradoxurus h. hermaphroditus*, Alfred, Sinha, Chakraborty, Checklist of Mammals of India, *Rec. zool. Surv. Occ. Paper No.* **199** : 126.

Common Name : Asian Palm Civet, Common Palm civet or Toddy cat.

Diagnostic Characters : A Common Palm civet or Toddy cat is a carnivore with six small, equal-sized incisors and a pair of comparatively large and conical canines. A civet is long in body and short in limbs. Body length ± 60 cm. It has an elongated head and pointed but short and weak muzzle. A black and blackish-brown civet with long coarse hair. Under wool, when present, whitish or buff or sometimes even yellow hidden in heavy winter coat. The new coat shows a definite pattern of dorsal stripes and lateral spots. Pattern of longitudinal stripes on the back and spots on the flanks, shoulders and thighs is present in the new coat. The limbs are always black or dark brown. Facial markings variable, the most common pattern is white patch or spot below the eye. Sometimes one spot above the eye and one on each side of the nose are also present. Tail uniformly dark in colour and without any alternate dark and pale bands. Cowper's gland absent. Feet compact with short claws unprotected by sheaths of skins. Soles of feet not entirely covered with hairs. Feet scansorial and semiplantigrade with double carpal and metatarsal pads. Four or five toes in fore and hind feet and not dog-like in structure. The first digit on the fore and hind foot, set well above the other toes, is functionless. Teeth not specialized like cats or reduced in number. Anus not enclosed in a glandular sac. Scent gland present in both sexes, in males between scrotum and prepuce, while in females it's behind or encircling vulva. The scent glands open in less specialized pouches. Inter-ramal tuft of vibrissae present.

Locality : Sighting reported from Nagarhole National Park by ZSI survey parties (Pradhan and Kurup, 2001) Reports also from Brahmagiri-Makut, Sirsi-Honnavara, Chamundi Hill in Mysore, Sharavathi valley, Pushpagiri, Talakaveri wildlife Sanctuaries, Bandipur National Park (Kumara and Singh, 2007; Karanth, 1986).

Habitat : Terrestrial, more arboreal and nocturnal. Prefers to live in all types of forests and also close to human dwellings. They live much on trees lying curled up by day among the branches. But many have adapted themselves to a life in human settlements, even in the heart of the crowded cities, selecting a roof, an outhouse, or even drain as a place of hiding. They take shelter in holes, tree holes, under rocks, under bushes or in tall grasses etc. They prefer to hunt in night. Though they are arboreal/semi-arboreal, they prey on the ground, preying on rats, squirrels, small birds, lizards, insects, fruits, roots, and other vegetable matters. Given opportunity, they can prey upon poultry as well. They can readily adapt to the changed conditions.

Distribution : Throughout India excluding deserts.

Status : Though the distribution is wide and the populations are many, they are fragmented. Further, though they are fairly common in distribution, now its population is declining due to the destruction of its habitat, hunting for

medicine and local illegal trade for body parts (Pradhan, 1997); IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Least concern (National) and Data Deficient (Global); Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule : Schedule II Part II, CITES : Nil.

Source : Corbet and Hill (1992), Agrawal *et al.* (1992), Karanth (1986), Pradhan and Kurup (2001), Menon (2003), Wilson and Reeder (2005) Alfred *et al.* (2006b) and Kumara and Singh (2007).

Remarks : The young ones are born in all seasons and are usually offered shelter in tree holes or under rocks. The civets can easily be tamed. Some are kept under domestication for the regular extraction of the secretion from the scent glands. The species is involved in illegal Wildlife trade due to belief in superstitions (Pradhan, 1997). All the civet species are under threat of illegal trade for this reason. Hence they should be brought under CITES appendices also

*63. ***Paradoxurus jerdoni caniscus*** Pocock

1885. *Paradoxurus jerdoni caniscus* Pocock, *J. Bombay Hist. Soc.,* **36** : 865.

1992. *Paradoxurus jerdoni caniscus*: Corbet and Hill, *The Mammals of the Indomalayan region* : 210.

Common Name : Jerdon's Palm Civet or Brown Palm Civet.

Diagnostic Characters : A Palm civet with body colour light grayish brown with or without grizzled on lower back. Head and Body length ranges between 450-600 mm. Hair on neck in reversed direction, growing forward from shoulder to the head. Facial vibrissae brown to blackish; Tail proportionately longer and tail tip pale brown in colour; Well-defined grey and black facial pattern or marks present; Greatest length of the skull in the range of 109-115mm; Palatal foramina long, projecting beyond the level of canine.

Locality : Sighting reported by ZSI parties from the border of Karnataka and Kerala States in Nagarhole park region (Pradhan and Kurup, 2001). Also reported from Brahmagiri-Makut, Pushpagiri-Bisale, Sharavathi valley and Pushpagiri, Talakaveri wildlife Sanctuary (Kumara and Singh, 2007).

Habitat : Restricted to the evergreen forests and the adjacent forests of the Western Ghats; Nocturnal in habit, feeds on birds, small mammals, insects and even fruits.

Distribution : Kerala and Tamil Nadu.

Status : Endemic to South India; IUCN Criteria proposed as per the CAMP Report (1998) : Vulnerable; Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule : Schedule II Part II, CITES : Appendix III.

Source : Corbet and Hill (1992), Karanth (1986), Pradhan and Kurup (2001), Menon (2003), Alfred *et al.* (2006b), Wilson and Reeder (2005) and Kumara and Singh (2007).

Remarks : Ellerman and Morrison-Scott (1951), Corbet and Hill (1992), Alfred and Chakraborty (2002), Wilson and Reeder (2005) and Alfred *et al.* (2006b) recognized two subspecies, *Paradoxurus jerdoni jerdoni* Blanford and *Paradoxurus jerdoni caniscus* Pocock. The distribution of the nominate subspecies is confined to Tamil Nadu and Kerala while the later is found only in Karnataka. The species is involved in illegal Wildlife trade due to belief in superstitions (Pradhan, 1997).

Subfamily VIVERRINAE

Subfamily *Viverrinae* is represented by two Genera *Viverricula and Viverra* in Karnataka state.

Key to the genera of the subfamily VIVERRINAE

– Dorsum with multiple longitudinal stripes, at least on rump; Mid-dorsal crest absent; black and white pattern on side of face absent ..... ***Viverricula***

– Absence of dorsal multiple longitudinal stripes; Mid-dorsal crest present; presence of black and white pattern on side of face .... ***Viverra***

Genus ***Viverricula***

A monotypic genus *Viverricula* is represented by a single subspecies *Viverricula indica indica* in Karnataka state.

*64. ***Viverricula indica indica*** (Desmarest)

1817. *Viverra indica* Desmarest, *Nouv. Dict. Hist. Nat.*, Paris, **7** : 170.

2006b. *Viverricula indica indica* : Alfred, Ramakrishna, Pradhan, Validation of Threatened Mammals of India. *Zool. Surv. India,* Kolkata : 254-257.

Common Name : Small Indian civet.

Diagnostic Characters : A Small Indian civet is a carnivore with six small, equal-sized incisors and a pair of comparatively large and conical canines. A civet is long in body and short in limbs. Body length ± 90 cm. It has an elongated head and pointed but short and weak muzzle. A tawny grey or grayish brown animal, lined and streaked on back. Body pattern consists of small spots on the fore quarters, larger spots tending to run into longitudinal lines on the flanks and form six to eight stripes down the back. There are usually some transverse white and black bands on the neck and throat region. Tail with alternate dark and pale bands. Cowper's gland absent. Feet compact with short claws unprotected by sheaths of skins. Feet terrestrial and digitigrades with single carpal pad and no metatarsal pads. Four or five toes in fore and hind feet and not dog-like in structure. The first digit on the fore- and hind foot, set well above the other toes, is functionless. Teeth not specialized like cats or reduced in number; Anus not enclosed in a glandular sac. Scent gland present in both sexes, in males between scrotum and prepuce, while in females it is behind or encircling vulva. Scent glands open into highly specialized pouches. Soles of feet not entirely covered with hairs.

Locality : Throughout Karnataka in all suitable habitats. Sighting reported from Bramhagiri-Makut, Belgaum Dist. Nagarhole, Nugu, Tumkur, Bandipur, Kolar and Chikmaglur dists. (Karanth, 1986; Pradhan and Kurup, 2001; Kumara and Singh, 2007).

Habitat : Terrestrial, semi-arboreal and nocturnal. Prefers to live in all types of forests and also close to human dwellings. They take shelter in holes, tree holes, under rocks, under bushes or in tall grasses etc. Some may find refuge in drains and outhouses. They prefer to hunt in night. They prey on the ground, preying on rats, squirrels, small birds, lizards, insects, fruits, roots, and other vegetable matters. Given opportunity, they can prey upon poultry as well. They can readily adapt to the changed conditions.

Distribution : Throughout India excluding deserts;*Status* :Though the distribution is wide and the populations are many, they are fragmented. Once very common in distribution, now its population is declining due to the destruction of its habitat, hunting for medicine and local illegal trade for body parts (Pradhan, 1997); IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Near threatened (National) Data Deficient (Global); Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule : Schedule II Part II, CITES : Appendix : III (India).

Source : Karanth. (1986), Corbet and Hill (1992), Wilson and Reeder (2005), Alfred *et al.* (2006b) and Kumara and Singh (2007)

Remarks : The care of the young ones is left entirely to the mother. The civets can easily be tamed. Some are kept under domestication for the regular extraction of the secretion from the scent glands.

Genus ***Viverra***

Genus *Viverra* is represented by a single species *Viverra civettina* in Karnataka state.

65. ***Viverra civettina*** Blyth

1862. *Viverra civettina* Blyth, *J. Asiat. Soc. Bengal*, **31** : 332.

2008. *Viverra civettina* : Nameer, P.O., Zoos' Print, **XXIII** (8) : 9.

Common Name : Malabar Large-spotted civet.

Diagnostic Characters : A large sized civet with Head and Body length in the range of 75-85 cm.; Tail shorter than Head and Body length

ranging between 32-40 cm.; A mane of black erectile hairs extending from between the shoulders to the entire length of tail; It possesses naked soles with interdigital webs; Body colour distinctly yellow with large black spots at the hinder part; Presence of black and white pattern on side of face; Tail tip is black; Tail ringed with six broad black complete rings with incomplete yellowish white rings between them.

Locality : Coastal districts of Western Ghats in Karnataka. Reported from Kudremukh National Park (Karanth, 1986; Pradhan and Kurup, 2001; Palot and Radhakrishnan, 2007; Kumara and Singh, 2007).

Habitat : Deciduous forests with streams and sufficient moisture regions.

Distribution : Endemic to southern Western Ghats in Kerala and Tamil Nadu.

Status : Extremely Rare; IUCN Criteria proposed as per the CAMP Report (1998) : Critically Endangered; Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule : Schedule I Part I, CITES : Appendix : III (India).

Source : Karanth (1986), Corbet and Hill (1992), Wilson and Reeder (2005), Alfred *et al.* (2006b), Palot and Radhakrishnan (2007) and Kumara and Singh (2007).

Remarks : *In-situ* survey, monitoring studies, limiting factor research and population studies are strongly recommended to assess the latest conservation status of Malabar civet (Alfred *et al.* (2006b).

Family HERPESTIDAE

Family Herpestidae is represented by a single Subfamily Herpestinae in Karnataka State.

Subfamily HERPESTINAE

Subfamily Herpestinae is represented by four species under one Genus, *Herpestes*, in Karnataka State.

Genus ***Herpestes***

Key to the species of *Herpestes*

1. Tail long, 90-100% of the head and body length 2

– Tail short, 50-70% of the head and body length 3

2. Dorsal pelage with shorter hairs (length 20-30 mm), grey in colour, Hairs many banded and coarse in nature, colour of legs same as that of dorsum, tail tip normal and never black, bulla normal and not inflated posterierly .... *Herpestes edwardsii*

– Dorsal pelage with longer hairs (length 30-40 mm), grayish in colour, legs darker than dorsum, tail tip black, bulla with posterior chambers greatly inflated .... *Herpestes smithii*

3. Hind feet long, 90-100mm; Dorsal pelage with longer hairs (length 50-60mm); Presence of black stripe from ear to shoulder .... *Herpestes vitticollis*

– Hind feet short, 65-87mm; Dorsal pelage with shorter hairs (length 25-35 mm); Absence of black stripe from ear to shoulder .... *Herpestes fuscus*

*66. ***Herpestes edwardsii*** (Geoffroy)

1818. *Ichneumon edwardsii* Geoffroy, E., *Description de l'Egypte* description *des mammiferes* 2, Paris : 139.

2008. *Herpestes edwardsii* : Nameer, P.O., Zoos' Print, **XXIII** (8) : 9.

Common Name : Indian Grey Mongoose.

Diagnostic Characters : The grey coloured Indian mongoose possesses long body with short limbs and a bushy tail. The longer contour hairs almost form a cape along the flanks and over hind quarters. The hairs at the base of the tail are fairly long. The fur is rather stiff and coarse, individual hairs being annulated with creamy white and black bands. Long hairs may have as many as eight to ten alternate bands of colours, under fur is wooly and reddish-buff in colour. Tip of the tail never black in colour.

Locality : Indian grey mongoose was sighted in Belgaum Dist., Bandipur, Nagarhole, Kudremukh National parks regions of Karnataka State by the ZSI Survey parties during the project period (Pradhan and Kurup, 2001; Palot and

Radhakrishnan, 2007); Tumkur, Nugu, Chikmanglur, Mysore, Bangalore (Kumara and Singh, 2007).

Habitat : Terrestrial, diurnal/nocturnal, fossorial, living in open scrubs, cultivation, rocky patches, forest edges, near human habitations etc.

Distribution : Throughout India.

Status : Fairly common, reported from many localities; IUCN Criteria proposed as per the CAMP Report (1998): Lower risk-least concern (National), Data Deficient (Global); Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule : Schedule II Part II; CITES : Appendix III.

Source : Karanth (1986), Corbet and Hill (1992), Pradhan and Kurup (2001), Wilson and Reeder (2005), Kumara and Singh (2007) and Palot and Radhakrishnan (2007).

Remarks : The mongoose can easily be tamed. Threat to its population due to hunting for medicine, trophies and food and also for local illegal trade for body parts for making articles like brushes etc. cannot be ruled out (Pradhan, 1997).

67. ***Herpestes smithii smithii*** Gray

1837. *Herpestes smithii* Gray J.E., *Magazine nat. Hist.* **1** : 578.

1992. *Herpestes smithii smithii* : Corbet and Hill, *The Mammals of the Indomalayan Region* : 216.

Common Name : Ruddy Mongoose.

Diagnostic Characters : Dorsal pelage of ruddy mongoose possesses large hairs, tail tip always black, legs darker than dorsum and bulla with posterior chamber greatly inflated, rest of the characters mostly similar to that of the previous species.

Locality : Reported from Nagarhole; Bandipur; Hasanur forests, Chamarajanagar dist.; Savandurga forests, Bangalore dist.; Daroji Bear Sanctuary, Bellary dist. in Karnataka state (Karanth, 1986; Kumara and Singh, 2007).

Habitat : Terrestrial diurnal/nocturnal, fossorial preferring to live in dry and moist forests of Central and Southern India.

Distribution : Peninsular India and Sri Lanka.

Status : Though seen less commonly, the species has been reported from number of localities; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-least concern (National), Data Deficient (Global), CITES : Appendix III, Indian Wildlife (Protection) Act (1972) as amended upto 2006) Schedule : Schedule II Part II.

Source : Karanth (1986), Corbet and Hill (1992), Pradhan and Kurup (2001), Wilson and Reeder (2005) and Kurup and Singh (2007).

Remarks : Threat to the populations of ruddy mongoose due to hunting for medicine, making of trophies and food and also for local illegal trade for body parts for making articles like brushes etc. cannot be ruled out (Pradhan, 1997).

68. ***Herpestes fuscus fuscus*** Waterhouse

1838. *Herpestes fusca* Waterhouse, *Proc. Zool. Soc. London* : 55

1992. *Herpestes fuscus fuscus* : Corbet & Hill, *The Mammals of the Indomalayan Region* : 216

Common Name : Brown Mongoose.

Diagnostic Characters : Head and Body length in the range of 330-480mm; Hind feet short about 65-87mm; Dorsal pelage blackish brown in colour with shorter hairs (length 25-35 mm); Tail about two-third of the total body length, considerably bushy and tapering to a conical point; Greatest length of the skull ranges between 77-93 mm.

Locality : Earlier reported from Nagarhole National Park and Coorg (Pradhan and Kurup, 2001); No recent sighting records from the state (Kumara and Singh, 2007).

Habitat : Inhabits moist forests.

Distribution : Kerala and Tamil Nadu.

Status : Subspecies endemic to India; IUCN Criteria proposed as per the CAMP Report (1998) : Vulnerable (National), Data Deficient (Global), CITES : Appendix III, Indian Wildlife (Protection)

Act (1972) as amended upto 2006) Schedule : Schedule II Part II.

Source : Prater (1980), Karanth (1986), Corbet and Hill (1992), Pradhan and Kurup (2001), Wilson and Reeder (2005) and Kurup and Singh (2007).

Remarks : They are relatively rare even in other parts of its distribution in India (Mudappa, 2002 in Kumara and Singh, 2007).

*69. ***Herpestes vitticollis*** Bennett

1835. *Herpestes vitticollis* Bennet, *Proc. Zool. Soc. London* : 67.

2008. *Herpestes vitticollis* : Nameer, P. O., Zoos' Print, **XXIII** (8) : 9.

Common Name : Stripe-necked Mongoose.

Diagnostic Characters : Largest of all Asiatic mongooses with Head and Body length in the range of 430-530 mm; Hind feet long about 90-100 mm; Dorsal pelage grizzled grey, tipped with chestnut red in colour with longer hairs (length 50-60 mm); A distinct black neck-stripe running from ear to shoulder; Tail short and darker towards tip about 50-70% of the head and body length; Greatest length of the skull ranges between 103-108 mm.

Locality : Sighting reported from Nagarhole, Bandipur and Kudremukh National Park, Bhadra and Talakaveri Wildlife Sanctuary (Karanth (1986), Pradhan and Kurup (2001), Kumara and Singh (2007), Palot and Radhakrishnan (2007).

Habitat : Evergreen forests of the Western Ghats and adjacent dry deciduous forests.

Distribution : Kerala and Tamil Nadu in Western Ghats and Sri Lanka.

Status : IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-least concern (National), Data Deficient (Global), CITES : Appendix III, Indian Wildlife (Protection) Act (1972) as amended upto 2006) Schedule : Schedule II Part II.

Source : Karanth (1986), Corbet and Hill (1992), Pradhan and Kurup (2001), Wilson and Reeder (2005) and Kumara and Singh (2007).

Remarks : Ellerman and Morrison-Scot (1951), Corbet and Hill (1992) and Wilson and Reeder (2005) recognized subspecies, viz. *Herpestes vitticollis vitticolis* and *Herpestes vitticollis inornatus* Pocock. Nominate subspecies occurs in south of Coorg in Western Ghats and Sri Lanka and later one found in North of Coorg (Type from North Kanara). There is gradual increase in reddish tones of dorsal pelage towards the south (Corbet and Hill, 1992).

Family ***Hyaena***

Medium-sized, dog like carnivore with pointed ears, weak hind quarter, forefeet with four digits and a sac-like scent gland above the anus. Hyaena also possesses very strong jaws.

Family Hyaenidae is represented by a single species under Indian Genus *Hyaena* in Karnataka state.

Genus ***Hyaena***

*70. *Hyaena hyaena* (Linnaeus)

1758. *Canis hyaena* Linnaeus, *Syst. Nat.*, 10th ed; **1** : 40.

2008. *Hyaena hyaena*: Nameer, P. O., Zoos' Print, **XXIII** (8) : 9.

Common Name : Striped Hyaena.

Diagnostic Characters : Hyaena possesses vertical dark stripes on the body and transverse bars on the upper portion of the legs with ground colour of body varying between cream and dirty white. A crest of mane extending from the head to root of the tail present. Dog like built with massive head and fore-body but with weak hind quarters.

Locality : Sighting reported from Belgaum Dist., Mangalore, Mysore and Coorg districts (Karanth, 1986; Pradhan and Kurup, 2001).

Habitat : Terrestrial, nocturnal, rare in forested areas but found in open countries, scrub lands and semi urban areas, found also in thorny semi arid regions. Prefer to live in low hilly areas and ravines which offer convenient holes and caves for shelter, mainly scavenger in habit but can also

hunt preys of its size like sheep, goat, dog etc. Hyaenas are also known to dig open graves in search of food.

Distribution : Extending south to Nilgiri hills, north to lowland of Kashmir, east to West Bengal and west to Gujarat.

Status : The species has been reported from number of localities in India, IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-near threatened (National) and Data Deficient (Global); Indian Wildlife (Protection) Act 1972 (as amended upto 2006) : Schedule : III.

Source : Karanth (1986), Corbet and Hill (1992), Pradhan and Kurup (2001), Menon (2003), Wilson and Reeder (2005) and Alfred *et al.* (2006).

Remarks : The population is under threat due to faiths in misbelieves and also due to illegal wildlife trade of its fur in domestic as well as international markets (Pradhan, 1997).

Suborder CANIFORMIA

Family CANIDAE

Family Canidae is represented by four species under three genera in Karnataka State.

Key to the genera and species of the family CANIDAE

1. A frontal sinus present; post-orbital process smooth and convex above; tail less than half the length of head and body 2

– Frontal sinus absent; post-oribital process concave above; tail clearly more than half the length of head and body .... *Vulpes bengalensis*

2. Seven teeth in lower molar series and dorsal colour a mixture of black and white 3

– Six teeth in lower molar series and dorsum more reddish in colour ..... *Cuon alpinus*

3. Smaller in size, Head and body length below 75 cm (60-75 cm); Greatest skull length ranges 145-165 mm ..... *Canis aureus*

– Larger in size, Head and body length above 75 cm (75-100 cm); Greatest skull length ranges 200-240 mm ..... *Canis lupus*

Genus ***Canis***

Genus *Canis* is represented by two species in Karnataka State

*71. ***Canis aureus*** Linnaeus

1758. *Canis aureus* Linnaeus, *Systema naturae* vol. **1**, 10th edition : 40.

2008. *Canis aureus*: Nameer, P.O., *Zoos' Print*, **XXIII** (8) : 9.

Common Name : Golden Jackal or Indian Jackal.

Diagnostic Characters : Smaller than the wolf and lacks the arching brows and elevated forehead. Head and body length in the range of 60-75 cm; Its height at shoulder about 35-43 cm. Greatest skull length ranges between 145-165mm. Upper molars with well defined cingulum; Dorsal colour typically a mixture of black and white, washed with buff about the shoulders, ears and legs, tail straight and not curled like dog.

Locality : Sighting reported from Coorg, Kudremukh National Park (Pradhan and Kurup (2001), Palot and Radhakrishnan(2007). Common everywhere in the Karnataka State (Karanth, 1986).

Distribution : Throughout India.

Status :The species has been reported from number of localities in India; IUCN Criteria proposed as per the CAMP Report (1998): Lower risk-least concern (National), Data Deficient (Global); Indian Wildlife (Protection) Act (1972, as amended upto 2002) : Schedule II Part II; CITES : Appendix III (India).

Source : Prater (1980), Corbet and Hill (1992), Agrawal *et al.* (1992), Pradhan and Kurup (2001), Menon (2003), Wilson and Reeder (2005) and Palot and Radhakrishnan(2007).

Remarks : Ellerman and Morrison-Scott (1951), Pradhan and Kurup (2001) and Wilson and Reeder (2005) recognized *Canis aureus naria* Wroughton

as a valid subspecies (Type loc. Virajpet, Southern Coorg) from Southern Peninsular India. The species is known to be hunted for domestic trade of body parts for medicinal and other usages and also in the international trade of body fur (Pradhan, 1997).

72. ***Canis lupus*** Linnaeus

1758. *Canis lupus* Linnaeus, *Systema naturae* vol. **1**, 10th edition : 39.

2008. *Canis lupus*: Nameer, P. O., *Zoos' Print*, **XXIII** (8) : 9.

Common Name : Gray wolf.

Diagnostic Characters : Largest member of the dog family with head and body length in the range of 75-100 cm; Its height at shoulder about 40-70 cm. Dorsal colour grey interspread with black; Bushy tail with black tip; Ears large and pointed; Long slim legs; Muzzle long and slender; Greatest skull length ranges between 200-240mm. Upper molars without cingulum.

Locality : Reported from Melkote, Ranebennur in Karnataka State (Karanth, 1986).

Distribution : Throughout India except extreme south.

Status : IUCN Criteria proposed as per the CAMP Report (1998): Lower risk-Near threatened (National), Data Deficient (Global); Indian Wildlife (Protection) Act (1972, as amended upto 2006) : Schedule I Part I; CITES : Appendix I.

Source : Karanth (1986), Corbet and Hill (1992), Menon (2003), Wilson and Reeder (2005) and Alfred *et al.* (2006b).

Remarks : Ellerman and Morrison-Scott (1951) and Wilson and Reeder (2005) recognized *Canis lupus pallipes* Sykes as a valid subspecies (Type loc. Deccan, India) from India. The species is known to be hunted for domestic trade of body parts for medicinal and other usages and also in the international trade of body fur (Pradhan, 1997).

Genus ***Cuon***

Monotypic genus with a single species *Cuon alpinus*, is known to occur in Karnataka State.

*73. ***Cuon alpinus*** (Pallas)

1811. *Canis alpinus* Pallas, *Zoogr. Ross. Asiat.* **1**,: 34.

2008. *Cuon alpinus*: Nameer, P.O., *Zoos' Print*, **XXIII** (8) : 9.

Common Name : Indian Wild Dog, Dhole.

Diagnostic Characters : Wild Dog is a typical carnivore belonging to the family *Canidae.* A medium sized canid with Head and Body length ± 90 cm and height at shoulder in the range of 43 – 55 cm. Appearance almost like a domestic dog except that wild dog possesses a straight tail and its dorsum is reddish in colour. Short in legs and muzzle. Ears rounded and tail tip bushy. First upper molar with a prominent outer cingulum. Six molar teeth. Body size is definitely smaller than wolf and lacks arching brows and elevated forehead.

Locality : Sighting report of pack of wild dogs in Nagarhole, Kudremukh, Sankadkatte, Kalkeri area by ZSI Survey parties during faunal surveys (Pradhan and Kurup, 2001; Palot and Radhakrishnan, 2007). Also reported from Bandipur and Dandeli (Karanth, 1986).

Habitat : Wild dog is basically a terrestrial animal preferring to live in different types of dense forests interspersed with open land, prey species and water (Johnsingh and Yoganand, 2000). They have also been found at an altitude of around 12000 Ft. However larger populations live in the lowlands. Wild dogs are more social animals and they live and hunt in packs. They prey upon animals like sheep, sambar, wild boar, gaur, buffalo etc.

Distribution : Practically whole of India (Menon, 2003).

Status : CAMP Report (1998) has stated that though number of wild dog populations have been reported from many localities, there is a general decline in its actual population in the country due to threat from declining population of prey species and loss of habitats; IUCN Criteria proposed as per the CAMP Report (1998):Lower risk- near threatened, Indian Wildlife (Protection) Act (1972,

as amended upto 2006) Schedule : Schedule: II Part: I, CITES: Appendix: II.

Source : Karanth (1986), Corbet and Hill (1992), Agrawal *et. al.* (1992), Pradhan and Kurup (2001), Menon (2003), Wilson and Reeder (1993) and Palot and Radhakrishnan (2007).

Remarks : Nil.

Genus ***Vulpes***

Only one species of the genus *Vulpes* occurs in Karnataka State.

74. ***Vulpes bengalensis*** (Shaw)

1800. *Canis bengalensis Shaw, Genl. Zool., 1,* **2** : 300.

2008. *Vulpes bengalensis* : Nameer, P. O., *Zoos' Print*, **XXIII** (8) : 9.

Common Name : Bengal Fox.

Diagnostic Characters : A grey coloured fox, having slender limbs with head and body length in the range of 40-65 cms; back of ears sandy brown and tail tip black in colour.

Locality : Reported from Ranebennur in Karnataka State (Karanth, 1986).

Habitat : Terrestrial, sometimes fossorial living in upper country, open fields etc., adjacent to the human habitations.

Distribution : Practically whole of India, south of Himalayan foothills to Kanyakumari except in the northeastern India.

Status : The species has been reported from number of localities in India, however the populations are fragmented; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-near threatened (National), Data Deficient (Global); Indian Wildlife (Protection) Act (1972, as amended upto 2006) : Schedule II Part II, CITES: Appendix III (India).

Source : Karanth (1986), Corbet and Hill (1992), Agrawal *et al.* (1992), Menon (2003), Wilson and Reeder (2005) and Alfred *et al.* (2006b).

Remarks : The species is known to be hunted for illegal domestic trade of body parts for black magic purposes and other usages and also in the international trade of body fur (Pradhan, 1997).

Family URSIDAE

Animals under this family are larger in size heavily built with short tail, plantigrade feet with planter pads and three lower molars on each side of the jaws.

Subfamily URSINAE

Family Ursidae is represented by a single species under one genus, *Ursus*, of Subfamily *Ursinae*, in Karnataka state.

*75. ***Melursus ursinus*** (Shaw)

1791. *Bradypus ursinus* Shaw, *Nat. Misc.*, 2 (unpaged), pls. 58-59.

2008. *Melursus ursinus* : Nameer, P. O., *Zoos' Print*, **XXIII** (8) : 9.

Common Name : Sloth bear.

Diagnostic Characters : A large-sized bear, 140-170 cms. in head and body length, having ivory white claws; coat rough and black with or without white crescent on chest.

Locality : Sighted in Nagarhole and Kudremukh National Park by ZSI Survey parties and forest officials during faunal surveys (Pradhan and Kurup, 2001; Palot and Radhakrishnan, 2007).

Habitat : Terrestrial and arboreal preferring to live in forests, grasslands etc.

Distribution : Throughout India from Himalayan foot hills to southernmost region, except arid region of Rajasthan and Gujarat.

Status : The species has been reported from many localities in India, however, the populations are fragmented; IUCN Criteria proposed as per the CAMP Report (1998) : Vulnerable (National) and Data Deficient (Global); Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule : Schedule I Part I, CITES : Appendix : I.

Source : Karanth (1986), Corbet and Hill (1992), Agrawal *et al.* (1992), Pradhan and Kurup

(2001), Alfred *et al* (2006b), Wilson and Reeder (2005) and Palot and Radhakrishnan (2007).

Remarks : Corbet and Hill (1992) placed this species under the genus *Ursus*. Ellerman and Morrison-Scot (1951), Wilson and Reeder (2005), Alfred *et al.* (2006b) and Nameer (2008) recognized the species under genus *Melursus*. Only nominate subspecies viz. *Melursus ursinus ursinus* (Shaw) has been reported from the Indian territory. Illegal wildlife trade of the body parts like gall bladder, claws etc. (Pradhan, 1997) is considered to be a serious threat in addition to the threat due to loss of habitat and fragmentary populations to the survival of the species.

Family MUSTELIDAE

Small to medium sized carnivores with a moderately long, stout and thick tail. Two lower molars present on each side of the jaws. The family, in general, is diversified in appearance and most of the species have been placed in two subfamilies, *Lutrinae* and *Mustelinae*. Both the subfamilies have been reported from Karnataka state.

Key to subfamilies of Family MUSTELIDAE

– Tail short, thick and muscular; Webbed feet; Fur short; mostly suitable for aquatic habit. ..... LUTRINAE

– Tail long, not thick and muscular; feet not webbed; Fur long; mostly suitable for terrestrial Habit ..... MUSTELINAE

Subfamily LUTRINAE

Subfamily *Lutrinae* (Otters) is represented by three genera and species from Karnataka State

Key to genera and species of subfamily LUTRINAE

– Feet fully webbed; Claws long, projecting well beyond digits 2

– Feet partly webbed; Claws rudimentary, not projecting beyond digits ..... *Aonyx cinerea*

– Dusky brown dorsum with much paler venter; Tail without lateral keels ..... *Lutra lutra*

– Blackish to rufous chocolate brown dorsum with slightly paler Venter; Tail with lateral Keels ..... *Lutrogale perspicillata*

Genus ***Aonyx***

76. ***Aonyx cinerea*** Illiger

1815. *Lutra cinerea* Illiger, *Abh. Akad. Phys. Klasse Wiss. Berlin,* 1804-11 : 90-99.

2008. *Aonyx cinerea* : Nameer, P. O., *Zoos' Print*, **XXIII** (8) : 9.

Common Name : Oriental small-clawed Otter.

Diagnostic Characters : A small sized otter with head and body length ranges between 360-460mm. Claws are rudimentary and do not project well beyond the digits. The feet are partly webbed. Dorsum dark brown, while venter slightly paler in colour. Edge of upper lip, chin, sides of neck and throat are grey or nearly white. Greatest length of the skull in the range of 85-95 mm.

Locality : Higher ranges of Bramhagiri and Southern Coorg in Karnataka State (Karanth, 1986; Pradhan and Kurup, 2001; Alfred *et al.,* 2006b).

Habitat : Found in rivers, streams and hill creeks.

Distribution : Range of distribution is wide spread but discontinuous, extends from Himalayan foothills near Kullu eastwards to Arunachal hill ranges, plains of Assam and Lower Bengal and higher ranges of Mysore, Nilgiris and Palni hills in southern India.

Status : IUCN Criteria proposed as per the CAMP Report (1998) : Not listed; IUCN (2002) : Lower-Risk-Near Threatened; Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule : Schedule I Part I, CITES : Appendix : II.

Source : Karanth (1986), Corbet and Hill (1992), Pradhan and Kurup (2001), Menon (2003), Wilson and Reeder (2005) and Alfred *et al* (2006b).

Remarks : Ellerman and Morrison-Scot (1951), Wilson and Reeder (2005) recognized two subspecies from Indian limit viz. *Aonyx cinerea*

concolor Rafinesque (Type loc. Garo Hill, Assam) and *Aonyx cinerea nirnai* Pocock (Type loc. Virajpet, Southern Coorg, South India).

Genus ***Lutra***

77. ***Lutra lutra nair*** Cuvier

1823b. *Lutra nair* Cuvier, F., Loutre, *Lutra. Dictionnaire des sciences natruelle*, Strasbourg & Paris. **27** : 237-250.

2006. *Lutra lutra nair* : Alfred, Ramakrishna and Pradhan, *Validation of Threatened Mammals of India*: 202-205.

Common Name : Common Otter.

Diagnostic Characters : The common otter with head and body length ranges between 540-800 mm. Claws projecting well beyond digits. The feet are fully webbed. It has a very dense fur of dark olive brown colour while venter much paler. Tail is very thick, muscular, without keels and flattened dorsoventrally in to a paddle shape at its distal end. The lips and throat show yellow, white and grey spots. Greatest length of the skull in the range of 100-130 mm.

Locality : Reported from Kabini, Bhadra reservoirs, Nagarhole in Karnataka State (Karanth, 1986; Pradhan and Kurup, 2001).

Habitat : Common otters live in a wide variety of aquatic habitats including high and low land lakes, rivers, streams, man made water bodies, marshes and coastal areas. Their movements on the ground are clumsy. However they are excellent divers and swimmers. They take shelter on land in the burrows. Their nursery or halt is always near the banks. Sometimes burrow opening is below water level. They may also excavate roots of the tree near banks. They undertake long distance migration during unfavourable seasons.

Distribution : Isolated and patchy distribution of the species in India. In southern India they have been reported from higher altitudes.

Status : (For *Lutra lutra* species) : IUCN (1998) (Proposed): Not Evaluated; IUCN (2002) (Proposed): Vulnerable based on Version 2.3 (IUCN, 2003); CITES APPENDIX: I; Indian Wildlife (Protection) Act (1972) (As amended upto 2006): Schedule II; Part II.

Source : Karanth (1986), Corbet and Hill (1992), Pradhan and Kurup (2001), Menon (2003), Wilson and Reeder (2005) and Alfred *et al.* (2006b).

Remarks : Southern population of common otter has been recognized as *Lutra lutra nair* Cuvier. The species is involved in local, domestic and international trade. Hunted for use of body parts in traditional medicinal treatments (Alfred *et al.* 2006b).

Genus ***Lutrogale***

78. ***Lutrogale perspicillata*** (Geoffroy)

1826. *Lutra perspicillata* I. Geoffroy, *Dict. class Hist. Nat.* **7** : 519.

2008. *Lutrogale perspicillata*: Nameer, P. O., *Zoos' Print*, **XXIII** (8) : 9.

Common Name : Smooth coated Indian otter.

Diagnostic Characters : Sides of frontal bones behind post-orbital processes more or less parallel upto constriction in front of brain case, fur short and depressed, hind foot short, feet fully webbed, throat creamy in colour. Tail with lateral keels.

Locality : Reported to occur in Karnataka state (Karanth, 1986; Pradhan and Kurup, 2001).

Habitat : Aquatic, preferring to live in and near reservoirs, large rivers, tanks at lower altitudes.

Distribution : Throughout peninsular India; including Eastern and North-Eastern regions.

Status : The species has been reported from number of localities in peninsular, eastern and north eastern India (Agrawal *et al.* 1992), however populations are fragmented; IUCN Criteria proposed as per the CAMP Report (1998) : Not Evaluated (National), Data Deficient (Global); Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule : Schedule II Part II, CITES : Appendix : II.

Source : Karanth (1986), Agrawal *et al.* (1992),

Corbet and Hill (1992), Pradhan and Kurup (2001) and Wilson and Reeder (2005).

Remarks : Not much information on its latest distribution, locations, populations etc. is available.

Subfamily MUSTELINAE

Subfamily Mustelinae (Martens) is represented by two genera and species from Karnataka State.

Key to genera and species of subfamily MUSTELINAE

– Tail long, about 55-80% of the head and body length; Dorsum reddish brown; Premolars 4/4 ..... *Martes gwatkinsii*

– Tail short, about 20-30% of the head and body length; Dorsum grey to pale yellow or whitish; Premolars 3/3 .....*Mellivora capensis*

Genus ***Martes***

79. ***Martes gwatkinsi*** Horsfield

1851. *Martes gwatkinsii* Horsfield, *Cat. Mamm. Mus. E. India Co.,* p. 90.

2008. *Martes gwatkinsii*: Nameer, P. O., *Zoos' Print*, **XXIII** (8) : 10.

Common Name : South Indian Yellow-throated Marten or Nilgiri Marten.

Diagnostic Characters : Nilgiri marten is similar to yellow throated martin (*Martes flavigula*) but appears to be larger in size than the later species. Head and body length 55-65cm. Dorsal side dark brown from head to rump and fore-quarters almost reddish. The throat is brightly coloured, ranging from pale yellow to bright orange.

Locality : Reported from Bramhagiri, Coorg, Dharwad in Karnataka state (Karanth, 1986; Pradhan and Kurup, 2001; Alfred *et al.,* 2006b).

Habitat : Riverine dense forest dwelling species. Though it can move on the ground, it is more comfortable on the trees. It can travel longer distances on tree canopies, if undisturbed, in dense and evergreen forests (Hussain, 1999). It is mostly diurnal in habit.

Distribution : Western Ghats endemic species of India, specially at higher altitudes in southern Western Ghats.

Status : IUCN Criteria proposed as per the CAMP Report (1998) : Vulnerable (National); Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule : Schedule II Part II, CITES : Appendix : III (India).

Source : Karanth (1986), Corbet and Hill (1992), Hussain (1999), Pradhan and Kurup (2001), Pradhan (2002), Wilson and Reeder (2005) and Alfred *et al.* (2006b).

Remarks : Individuals of this species in some areas raid boxes in farms and feed on Honey. Hence, such animals are treated as pests in these areas (Hussain, 1999). Factual confirmation, verification and remedies are essential in such cases.

80. ***Mellivora capensis*** (Schreber)

1776. *Viverra capensis* Schreber, *Saugeth*, pl. 125.

2008. *Mellivora capensis*: Nameer, P. O., *Zoos' Print*, **XXIII** (8) : 10.

Common Name : Ratel or Honey Badger.

Diagnostic Characters : Heavy built body with head and body length 64-84 cm.; Legs and tail relatively short; Dorsal parts from the top of the head to the base of the tail varying from grey to pale yellow or whitish, venter and legs black.

Locality : Reported from Kolar dist., Sathanur, Bangalur dist. (Karanth, 1986; Kumara and Singh, 2007).

Habitat : Terrestrial, fossorial and nocturnal preferring to live in desert as well in dry and moist deciduous forests, but avoiding regions of heavy rainfalls. Big claws are used essentially for digging in the ground. Though ratels are omnivorous, they are essentially flesh eaters.

Distribution : Almost throughout India except North-east India, Jammu and Kashmir and Western Ghats.

Status : IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Near threatened (Nationally), Indian Wildlife (Protection) Act

(1972, as amended upto 2006) Schedule : Schedule I Part I.

Source : Karanth (1986), Corbet and Hill (1992), Hussain (1999), Pradhan and Kurup (2001), Wilson and Reeder (2005), Alfred *et al* (2006b).

Remarks : Ellerman and Morrison-Scott (1951) kept *Mellivora capensis* under the subfamily Mellivorinae. Corbet and Hill (1992), Wilson and Reeder (2005) and Nameer (2008) recognized this species under the subfamily Mustelinae of the family Mustelidae. Weasels, Badgers and Otters differ so much from each other in appearance that it is difficult to believe that there is any relationship between them. However, certain similarities in skull and molar structures show resemblance and common affinity between them.

Order CETACEA

The species under order CETACEA are highly specialized and wholly adapted to an aquatic existence, with reproduction and feeding taking place in water. The animals of this order have developed smooth, spindle shaped and hairless bodies with fore limbs flattened into paddle shaped flippers. Hind limbs are absent, while tail tip expanded into lateral, horizontal flukes. Teeth absent or when present simple or conical.

Order *Cetacea* is represented by two suborders in Karnataka State.

Key to the two suborders of CETACEA

– Teeth present and horny 'baleen' plates absent ..... ODONTOCETI

– Teeth absent while horny 'baleen' plates present ..... MYSTICETI

Suborder MYSTICETI

Only one family has been reported from Karnataka State.

Family BALAENOPTERIDAE

Family Balaenopteridae is represented by two species under Genus *Balaenoptera* in Karnataka State.

Key to the two species of Genus *Balaenoptera*

– Largest marine mammal along Indian coast, length about 24-28 metres and even more; Body streamlined, larger normal, and without any "V" shaped pointed head with no central ridge on dorsal side, Females larger than males; Body bluish grey in colour, often mottled with yellowish grey. Characteristic white patch on right side of the lower jaw absent giving jaws uniform in appearance ... . *Balaenoptera musculus*

– Second large-sized whale species with maximum length recorded up to 24 metres. Head "V" shaped and pointed with a prominent central ridge over it. Body dark grey to blackish above with no mottling, white underneath. There is a large white patch on right side of lower jaw giving a characteristic asymmetrical appearance .... *Balaenoptera physalus*

81. ***Balaenoptera musculus*** (Linnaeus)

1758. *Balaena musculus* Linnaeus, *Syst. Nat.* 10th ed., **1** : 76.

2008. *Balaenoptera musculus* : Nameer, P. O. *Zoos' Print,* **XXIII** (8) : 11.

Common Name : Blue Whale or Lesser Rorqual. *Diagnostic Characters* : Largest living mammal, length about 24-28 metres; Lower jaw smaller than upper jaw. Body streamlined, larger head, flippers are long and tapering; Females are slightly larger than males; Body bluish grey in colour, often mottled with yellowish grey.

Locality : Reported in the past (in 1874) from Mangalore coast in Karnataka State (Sathasivam, 2004).

Habitat : Blue whale prefers to live in cold water and open sea. It is involved in seasonal inter continental migration. Lives singly or in pairs, seldom seen in large schools. Feeds mainly on euphausids (Krills), amphipods, copepods and cephalopods.

Distribution : Worldwide. From polar to tropical waters. Living in polar waters during

summer, migrating towards equator in winter. One population has spread and separated from the one in Southern hemisphere and lives in North Indian Ocean waters at all the times of the year. This population has been named as Pygmy Blue Whales. They have been reported from Mangalore, Cochin, Tuticorin, Calicut, Surat, Okha and number of other places along the Indian cost. Records based mostly on carcasses washed towards shore.

Status : IUCN Criteria proposed as per the CAMP Report (1998) : Critically Endangered (National) and Data Deficient (Global), Indian Wildlife (Protection) Act (1972) (As amended upto 2006): Schedule II; Part I, CITES Appendix: I.

Source : Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Agrawal and Alfred (1999), Sathasivam (2004) and Alfred *et al.* (2006a,b).

Remarks : Nil.

82. ***Balaenoptera physalus*** (Linnaeus)

1758. *Balaena physalus*, Linnaeus, *Syst. Nat.* 10th ed. **1** : 75.

2008. *Balaenoptera physalus*: Nameer, P. O. *Zoos' Print,* **XXIII** (8) : 11.

Common Name : Fin Whale.

Diagnostic Characters : Fin Whale is a second large-sized whale species next to Blue Whale in Indian waters. Fin whale possesses "V" shaped pointed head with a prominent central ridge over it. 56-100 ventral furrows extending upto naval present. Back ridged from dorsal fin to tail fluke. Dorsal fin small but distinct. Baleen plates 230-370 in number on each side with size of 42 × 24 cm. Plates are stripped with alternate yellow and blue bands. Body dark grey to blackish above with no mottling, white underneath. There is a large white patch on right side of lower jaw giving a characteristic asymmetrical appearance in coloration. Maximum length recorded upto 24 meters.

Locality : Catching of fin whale reported at Ullal, South Kanara and Kodi Kanyana (Kota) in Karnataka (Sathasivam, 2004).

Habitat : Oceanic and pelagic inhabitant. Also involved in seasonal long distant migrations. Lives in a group of 3-10 or even 20 individuals. Feeds mainly on krills, squids and copepods. Its main predator is killer whale.

Distribution : Circumtropical (Indian Ocean and Pacific Ocean).

Status : IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-near threatened (National) and Data Deficient (Global), Indian Wildlife (Protection) Act (1972)(as amended upto 2006) Schedule II Part I, CITES : Appendix I.

Source : Corbet and Hill (1992), Agrawal and Alfred (1999), Sathasivam (2004) and Alfred *et. al.* (2006a, b).

Remarks : Survival of the species in the region is threatened due to heavy hunting for international commercial trade, pollution, accidental death due to trapping in gill nets, collisions with motor boats, fishing vessels etc.

Suborder ODONTOCETI

Out of seven known families described under this suborder, only three families have been reported from Karnataka State.

Key to the three families of Odontoceti

1. Maximum length in the region 20 metres; Lower jaw shorter than upper one .... PHYSETERIDAE

– Maximum length in the region below 20 meters; Lower jaw not shorter than upper one 2

2. Maximum length in the region 10 metres, dorsal fin usually high and pointed and teeth large or moderate and conical .... DELPHINIDAE

– Maximum length in the region 1.8 metres, dorsal fin totally absent, teeth flat crowned ..... PHOCOENIDAE

Family DELPHINIDAE

Family DELPHINIDAE is represented by six genera in Karnataka State.

Key to the Genera of DELPHINIDAE

1. Large sized delphinids with maximum length above 5.4 meters 2
– Small sized delphinids with maximum length below 5.4 meters 3
2. Length about 8.5-10 m; Notch between forehead and snout present ..... ***Orcinus***
– Length about 5.4-6m; Notch absent between forehead and snout ..... ***Pseudorca***
3. Broad hump below dorsal fin present ..... ***Sousa***
– Broad hump below dorsal fin absent 4
4. Presence of 20-26 teeth on each side of the jaw ..... ***Tursiops***
– Presence of 35 and above teeth on each side of the jaw 5
5. No stripe between eyes and flippers and eyes and anus; palate with deep groove on each side; 40-50 teeth present on each side of the jaw ..... ***Delphinus***
– A stripe present from eyes to flippers or from eyes to anus; palate devoid of any groove on each side; 35-65 teeth present on each side of the jaw ..... ***Stenella***

Genus ***Delphinus***

Only one species of Genus *Delphinus* occurs in Karnataka State.

83. ***Delphinus delphis*** Linn.

1758. *Delphinus delphis* Linnaeus, C. *Systema naturae* 10th Ed., **1** : 77.

2008. *Delphinus delphis*: Nameer, P. O. *Zoos' Print,* **XXIII** (8) : 11.

Common Name : Common Dolphin or Short-beaked Saddleback Dolphin.

Diagnostic Characters : The snout is prolonged into a long narrow beak separated by a groove from the forehead. Both jaws contain conical teeth exceeding 35 in numbers in each row. Body slender, blowhole single, dorsal and pectoral fins falcate. Dorsum black or dark grey and under parts whitish, while sides with bands of fulvous or ochreous in colour.

Locality : Along coastal region of Karnataka State (Alfred *et al.* (2006b).

Habitat : Dolphins are aquatic in nature and seen in schools in coastal waters, one of the fastest marine animal attaining the speed upto 30 knots.

Distribution : Circumtropical, Indian, Pacific and Atlantic Oceans.

Status : Many sightings have been reported from number of localities along Indian coastline, IUCN Criteria proposed as per CAMP Report (1998) : Lower risk-Near threatened (National), Data Deficient (Global), Indian Wildlife (Protection) Act (1972 as amended upto 2006), Schedule : Schedule II, Part I, CITES : Appendix II.

Source : Corbet and Hill (1992), Agrawal and Alfred (1999), Sathasivam (2000, 2004) and Alfred *et al.* (2006a,b).

Remarks : Dolphin is known from very ancient times and has figured in myths and legends of early Mediterranean civilization. Now it is being kept in dolphinarium all over the world.

Genus ***Orcinus***

Only one species of Genus *Orcinus* has been reported from Karnataka State.

84. ***Orcinus orca*** Linn.

1758. *Delphinus orca* Linnaeus, C. *Systema naturae* 10th Ed., **1** : 77.

2008. *Orcinus orca*: Nameer, P.O. *Zoos' Print,* **XXIII** (8) : 11.

Common Name: Killer Whale.

Diagnostic Characters : Largest member of the Dolphin family with length 8.5-10m; Body blackish above, light grey behind the dorsal fin and white below forming a trident posteriorly; Snout bluntly rounded, devoid of beak; It possesses high, erect and large dorsal fin and broadly oval pectoral flippers; A white patch behind eyes and an obscure patch behind dorsal fin present.

Locality : Its range of distribution along Indian Coastal line from Gujarat to Tamil Nadu and Andamans and Nicobar and Lakshadweep islands (Menon, 2003; Alfred *et al.,* 2006a); Possibly occurs along the Karnataka coast as well.

Habitat : Deep, colder waters off east and west coasts.

Distribution : Cosmopoliton, occurring in all oceans, from the tropics to the polar regions.

Status : IUCN Criteria proposed as per CAMP Report (1998) : Lower risk-Near threatened (National), Data Deficient (Global), Indian Wildlife (Protection) Act (1972 as amended upto 2006), Schedule : Schedule II, Part I,CITES : Appendix II.

Source : Corbet and Hill (1992), Agrawal and Alfred (1999), Menon (2003), Sathasivam (2004) and Alfred *et al.* (2006a).

Remarks : Nil.

Genus ***Pseudorca***

85. ***Pseudorca crassidens*** (Owen)

1846. *Phocaena crassidens* Owen, *Hist. Brit. Foss. Mamm. Birds,* p. 516, fig., 213.

2008. *Pseudorca crassidens*: Nameer, P. O. *Zoos' Print,* **XXIII** (8) : 11.

Common Name : False Killer Whale.

Diagnostic Characters : Smaller than the Killer Whale with total length about 6 meters; Long slender body, smaller but bulbous head , distinct backwardly curved dorsal fin and tapering flippers; Body uniformly dark in colour, white on the chest.

Locality : Recorded from West coast from Kozhikode, Trivandrum and Gulf of Cambay (Kumaran, 2004; Alfred *et al.,* 2006b); Possibly occurring along the Karnataka coast also.

Habitat : False killer whale is mainly a deep water oceanic form preferring to feed primarily on cephalopods and large fishes. They play, ride on the waves and leap above the surface. Oceanic deep water forms, but they may approach coast line near deep waters.

Distribution : World wide, in tropical and temperate oceans including Indian Ocean, Arabian Sea and Bay of Bengal. Recorded from East, West Coast and around Andaman and Nicobar Islands.

Status : IUCN Criteria proposed as per CAMP Report (1998) : Lower risk-Near threatened (National) Indian Wildlife (Protection) Act (1972 as amended upto 2006), Schedule : Schedule II, Part I, CITES : Appendix II.*Source* : Corbet and Hill (1992), Agrawal and Alfred (1999), Sathasivam (2004) and Alfred *et al.* (2006a,b).

Remarks : Nil.

Genus ***Sousa***

Genus *Sousa* is represented by a single species, *Sousa chinensis,* in Karnataka State.

86. ***Sousa chinensis*** (Osbeck)

1765. *Delphinus chinensis* Osbeck, P. *Reise nach Ostindien und china.* Rostock xxiv : pp. 552, 13 pls.

2008. *Sousa chinensis*: Nameer, P. O. *Zoos' Print,* **XXIII** (8) : 11.

Common Name : Indo-Pacific hump-back Dolphin.

Diagnostic Characters : Medium sized dolphin with maximum length reaching upto 3 meters, the beak is slender and sharply defined from forehead, characteristic broad hump below dorsal fin present, teeth in each row less than 35 in number.

Locality : Stranding report of Indo-Pacific Humpback Dolphin specimens along coastal areas (Malabar coast) adjacent to Karnataka coast line (Sathasivam, 2004).

Habitat : Aquatic, marine, coastal, estuaries, confluence of rivers with seas etc. They have also been reported from the lower reaches upto 250 kms of the Chinese rivers.

Distribution : Indo-Pacific region.

Status : Many sightings have been reported from number of localities along Indian coastline; IUCN Criteria proposed as per CAMP Report (1998) : Endangered (National), Data Deficient (Global); Indian Wildlife (Protection) Act (1972 as amended upto 2006), Schedule : Schedule : II Part I; CITES : Appendix : I.

Source : Corbet and Hill (1992), Roberts (1997), Agrawal & Alfred (1999) and Sathasivam (2004).

Remarks : The species is reported to be declining in population, occurrence, area of occupancy and quality of habitat. Survival threat to the population is due to number of accidental death in fishing nets while catching fishes.

Genus ***Stenella***

Genus *Stenella* is represented by a single species, *Stenella longirostris,* in Karnataka State.

87. ***Stenella longirostris*** (Gray)

1828. *Delphinus longirostris* Gray, *Specil. Zool.* **1**, 1.

2008. *Stenella longirostris*: Nameer, P.O. *Zoos' Print,* **XXIII** (8) : 12.

Common Name : Spinner dolphin.

Diagnostic Characters : Medium sized streamlined bodied dolphin with maximum length reaching upto 2.5 metres, the beak is slender, long and sharply defined from forehead, teeth in each row in the range of 45-65 in number. Body colour pattern variable. However, it is, in general, grey above white below with paler sides. A grey stripe runs from eye to flipper or from eye to anus. Adults without spots on the back. Subtriangular dorsal fin located in the middle of the back. Tip blunt and backwardly directed. Tail fluke with strongly keeled base and notched in the middle.

Locality : Reported from south of Mangalore along the West coast of Karnataka State (Sathasivam, 2004).

Habitat : Oceanic pelagic form of circumtropical waters. The spinner dolphins are seen in large schools (200 to 1000) in offshore and deep waters. Feeds mainly on fishes and squids.

Distribution : Indo-Pacific region.

Status : Many sightings have been reported from number of localities along Indian coastline; IUCN Criteria proposed as per CAMP Report (1998) : Lower risk – Near threatened (National), Data Deficient (Global); Indian Wildlife (Protection) Act (1972, as amended upto 2006), Schedule : Schedule : II Part I; CITES : Appendix : II.

Source : Corbet and Hill (1992), Roberts (1997), Agrawal & Alfred (1999), Sathasivam (2004) and Alfred *et al.* (2006a,b).

Remarks : Survival threat to the population is due to human interference, trade pollution, number of accidental deaths in fishing nets while catching fishes and excessive tourism in dolphin habitats.

Genus ***Tursiops***

88. ***Tursiops truncatus*** (Montagu)

1821. *Delphinus truncatus* Montagu, *Mem. Warnerian Nat. Hist. Soc.,* **3** : 75, pl. 3.

2008. *Tursiops truncatus*: Nameer, P. O. *Zoos' Print,* **XXIII** (8) : 12.

Common Name : Bottle-nosed Dolphin.

Diagnostic Characters : A stout dolphin with total length about 2.3-3.8m; Snout clearly demarcated by bulbous forehead by sharp groove. Dorsal body colouration varies in the range from grey to black; No stripes or spots on the body.

Locality : Recorded specimens along West coast areas (Calicut, Cochin, Trivandrum) adjacent to Karnataka coast line (Sathasivam,2004); Possible occurrence along Coastal area of Karnataka can not be ruled out.

Habitat : Oceanic form. Species is known to inhabit offshore and inshore temperate as well as tropical waters. The inshore range extends to river mouths, bays, lagoons, estuaries and 0-5-20m deep shallow marine regions. Bottle-nosed Dolphin lives in a group size of 2-18. However inshore schools of 200 and offshore schools of 500 have also been recorded.

Distribution : Worldwide.

Status : IUCN Criteria proposed as per CAMP Report (1998) : Lower Risk-Near Threatened (National) Indian Wildlife (Protection) Act (1972 as amended upto 2006), Schedule : Schedule II, Part I, CITES : Appendix II.

Source : Corbet and Hill (1992), Agrawal and

Alfred (1999), Sathasivam (2004) and Alfred *et al.* (2006a,b).

Remarks : Nil.

Family PHOCOENIDAE

Family PHOCOENIDAE is represented by a single species under the Genus *Neophocaena* in Karnataka State.

89. ***Neophocaena phocaenoides*** (Cuvier)

1827. *Delphinus phocaenoides*, Cuvier, G., *Règne Anim., Nouv.* Ed., **1** : 291.

2008. *Neophocaena phocaenoides* : Nameer, P. O. *Zoos' Print,* **XXIII** (8) : 12.

Common Name : Black finless porpoise.

Diagnostic Characters : Absence of dorsal fin is the characteristic feature, length not more than 2 metres, teeth flat crowned and not more than 15-20 in each row. Little finless porpoise is one of the smallest cetaceans. Head blunt rounded without any beak. Eyes rather well developed. Blowhole crescentric in shape. Flippers small and elliptical. There are small, hard and horny tubercles in the mid region of the back extending upto caudal peduncle. Tail compressed horizontally with a notch in the middle. Body colour dark slaty grey with purplish white patches on throat and lips.

Locality : Occurrence of finless porpoise specimens has been reported near the Malpe, South Kanara; Karwar; Ullal near Mangalore coast, Karnataka State (Sathasivam, 2004).

Habitat : The finless porpoise is aquatic preferably marine as well as estuarine, both, in habit. Prefers to live in coastal, river mouth, and estuarine waters. It has been reported to reach lower reaches upto 65 kms. from the mouth of Indus river in Pakistan and over 1000 kms. from the mouth of Yangtze river in China.

Distribution : Circumtropical (Indian Ocean and Pacific Ocean).

Status : Reported to have been occasionally caught in gill nets from number of localities along the Indian coast line, IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-near threatened (National) and Data Deficient (Global), Indian Wildlife (Protection) Act (1972)(as amended upto 2006) Schedule I Part I, CITES : Appendix I; Red Data Book (National)(1994) : Insufficiently known.

Source : Corbet and Hill (1992), Agrawal and Alfred (1999), Sathasivam (2004) and Alfred *et al.* (2006a,b).

Remarks : Survival of the species in the region is threatened due to pollution, accidental death due to trapping in gill nets, collisions with motor boats, fishing vessels etc.

Family PHYSETERIDAE

Family PHYSETERIDAE is represented by a single species under the Genus *Physeter* in Karnataka State.

90. ***Physeter macrocephalus*** Linnaeus

1758. *Physeter macrocephalus* Linnaeus, *Syst. Nat.,* 10th ed., **1** : 76.

2006. *Physeter macrocephalus* : Alfred *et al.Validation of Threatened Mammals of India* : 393-395

Common Name : Sperm Whale..

Diagnostic Characters : Large sized, with length in the range of 8-18m.; Head enormous, squarish, about one-third size of the body containing a large organ filled with spermaceti; Body colour grey to dark bluish grey; Upper jaw toothless; Lower jaw narrow and under slung studded with 18-27 large thick and conical teeth on each side; No dorsal fin but row of humps present on posterior half of the back up to the tail.

Locality : Reported from West coast area (Kerala and Maharashtra) adjacent to Karnataka State (Alfred *et al.,* 2006a,b; Palot, 2007).

Habitat : Deep water oceanic forms. Usually not found in areas with less than 180 m depth. They can dive as deep as 2800 meters and be under water for more than an hour. Further they can remain on surface and below nearly 50 times for an hour before next deep dive. Sperm Whale may be found solitary or in groups.

Distribution : World wide. Sperm Whale

females and young males are confined between 45'N and 45'S latitudes, while mature males travel upto Arctic and Antarctic oceans. Reported from east and west coasts of India (Alfred *et al.* (2006a,b).

Status : IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-near threatened (National) Indian Wildlife (Protection) Act (1972)(as amended upto 2006) Schedule II Part I, CITES : Appendix I.

Source : Corbet and Hill (1992), Agrawal and Alfred (1999), Sathasivam (2004), Alfred *et. al.* (2006a,b), Palot (2007).

Remarks : Nil.

Order SIRENIA

Order Serenia is known by the massive spindle-shaped marine animals with no external trace of dorsal fin or hind limbs, tail-tip expanded and horizontally flattened and cheek teeth flat-crowned. Head rounded and truncated. Order SIRENIA is represented by a single family *Dugongidae* in Karnataka State.

Family DUGONGIDAE

Family Dugongidae is represented by a single species, *Dugong dugon* under the Genus *Dugong* in Karnataka State.

Genus ***Dugong***

91. ***Dugong dugon*** (Mueller)

1776. *Trichecus dugon* Mueller, *Linne's Vollstandiges Natursyst. Suppl.*, : 21.

2008. *Dugong dugon* : Nameer, P. O. *Zoos' Print,* **XXIII** (8) : 12.

Common Name : Dugong or sea cow.

Diagnostic Characters : Body is streamlined with belly more or less flat while the back and sides are rounded. Neck absent, head massive somewhat truncate anteriorly. Fleshy pad-like upper lip, projecting over the lower lip and provided with fine stiff bristles around the muzzle; Nostrils situated on top of the head, eyes small and deeply sunk. Clawed, flipper – like forelimbs, hind limbs absent. Incisors in adult males tusk like. Nostrils are situated on top of the head.

Locality : Reported from adjacent coastal areas such as Kokan and Malabar coasts (Agrawal and Alfred, 1999).

Habitat : *Dugong* is restricted to coastal, shallow and marine habitat feeding mainly upon sea-grasses of the families *Potamogetonaceae* and *Hydrocharitaceae*. Sea cows are totally aquatic herbivores.

Distribution : Coastal waters of Asia, Africa and Australia.

Status : Many sightings have been reported from number of localities along Indian Coastline, IUCN Criteria proposed as per CAMP Report (1998) : Critically Endangered (National), Data Deficient (Global), Indian Wildlife (Protection) Act (1972 as amended upto 2006) Schedule : Schedule I Part I, Red Data Book (1994) (National): Vulnerable, CITES : Appendix : I.

Source : Corbet and Hill (1992), Agrawal and Alfred (1999), Sathasivam (2004) and Alfred *et al.* (2006ab).

Remarks : Sea cow populations along Indian coastline are reported to be under threat due to decline in area of occupancy, extent of occurrence and also due to hunting for its flesh, hide, fat, bones and tusks.

Order PROBOSCIDEA

Order Proboscidea is represented by the animals with massively built body, possessing long flexible proboscis. Males generally possess large tusks i.e. enlarged incisors. Molars large and transversely ridged.

The order contains a single family *Elephantidae*.

Family ELEPHANTIDAE

In India Family *Elephantidae* is represented by a single subspecies, *Elephas maximus indicus* Cuvier under a species *Elephas maximus* of Genus *Elephas*.

*92. ***Elephas maximus indicus*** Cuvier

1797. *Elephas indicus* Cuvier, *Tabl. Elem. Hist. Nat.*: 148 (India).

2006. *Elephas maximus indicus* Cuvier : Alfred *et al. Validation of Threatened Mammals of India* : 396-399.

Common Name : Indian Elephant.

Diagnostic Characters : Elephant possesses massively built body with a long flexible proboscis. Proboscis ends in a single lip. Males generally possess large tusks i.e. enlarged incisors. Molars large and transversely ridged. Height at shoulder reaches upto 335 cm. Body blackish grey throughout. Four nails on each hindfoot. Ears large but not enormous like African elephant.

Locality : Reported sighting of elephant herds in Bandipur, Nagarhole, Kudremukh National Park in Karnataka State by ZSI survey teams (Pradhan and Kurup, 2001; Palot and Radhakrishnan, 2007).

Habitat : Terrestrial, preferring to live in tropical dry and moist deciduous forests including savannah grasslands. Can undertake long distance migration in search of food, shelter and water. Possesses excellent sense of smell and memory. Extremely adaptable. Very social and lives in herds of varying sizes.

Distribution : Southern Western Ghats, Eastern Ghats, parts of Central, northern, eastern and north-eastern India.

Status : The species has been reported from number of fragmented localities, IUCN Criteria proposed as per CAMP Report (1998) : Vulnerable (National) and Data Deficient (Global), Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule : Schedule I Part I, CITES : Appendix I, Red Data Book (1994): Vulnerable.

Source : Karanth (1986), Corbet and Hill (1992), Pradhan and Kurup (2001), Alfred *et. al.* (2002, 2006b), Wilson and Reeder (2005) and Palot and Radhakrishnan (2007).

Remarks : Elephants are involved in large scale illegal trade at domestic as well as international level, mostly for ivory and other body parts (Pradhan, 1997). The populations are under threat due to illicit wildlife trade, fragmentation of populations, loss of natural habitat, corridors etc. These result in elephant encroachments in cultivation, house hold properties and elephant-human conflicts (Agrawal *et al.*, 1992).

Order ARTIODACTYLA

Even-toed ungulates, axis of the foot between third and fourth toes; toes enclosed in horny hooves of roughly same size giving appearance of single hoof. Four families in Karnataka State represent order *Artiodactyla.*

Key to the families of the Order ARTIODACTYLA

1. Animals devoid of horns and antlers; Snout with naked nasal disc; stomach with two chambers ..... SUIDAE

– Animals with horns or antlers, at least in males; Snout normal and without any nasal disc; stomach with 3-4 chambers 2

2. Metacarpals of 2nd and 5th digits complete; pre-orbital glands absent, I_1 not angular and wider than I_2 , C_1, modified into tusks, stomach with three chambers ..... TRAGULIDAE

– Metacarpals of 2nd and 5th digits rudimentary; pre-orbital gland may or may not be present, I_1 angular and much wider than I_2 , C_1 may or may not be modified into tusks, stomach with four chambers 3

3. Permanent horns, at least in males, present; C_1 absent; post-oribtal gland may or may not be present ..... BOVIDAE

– Deciduous antlers present in males; C_1 present in normal shape; post orbital gland present. ..... CERVIDAE

Family SUIDAE

Family Suidae is represented by a single species, *Sus scrofa*, under a single genus, *Sus*, in Karnataka State.

*93. ***Sus scrofa*** Linn.

1758. *Sus scrofa* Linnaeus, *Systema naturae* Vol. **1**, 10th Ed. Holmia : 824.

2008. *Sus scrofa* : Nameer, P. O., *Zoos' Print*, **XXIII** (8) : 10.

Common Name : Wild Boar.

Diagnostic Characters : Greatly elongated muzzle terminating in a flattened naked nasal disc adapted for rooting up subterranean parts of plants, upper incisors present, stomach with two chambers only , crest of black bristles present from nape to the back.

Locality : Common throughout Karnataka State (Karanth, 1986). Reported from most of the protected areas of Karnataka State such as Bandipur, Nagarhole, Kudremukh, Bannerghatta National Park; Bilgiri Rangaswamy Temple wildlife sanctuary, (Pradhan and Kurup, 2001; Aravind, 2006; Palot and Radhakrishnan, 2007; Valarmathi and Krishnan, 2007).

Habitat : Terrestrial, wild boar lives in grassy or scanty bushy jungle, forest, most commonly seen in high crops also.

Distribution : Throughout India.

Status : Reported from many localities, human-wild boar conflict occurs due to crop damages, IUCN Criteria proposed as per CAMP Report (1998) : Lower risk-least concern (National), Data Deficient (Global); Indian Wildlife (Protection) Act 1972 (as amended upto 2006), Schedule : Schedule III.

Source : Corbet and Hill (1992), Menon (2003) and Wilson and Reeder (2005).

Remarks : Wild Boar causes extensive damage to the standing crops.

Family TRAGULIDAE

The cloven hoofed deers are smallest of the ungulates possessing, like musk deer, enlarged upper canines in males. Mouse deers are included in this family because they do not possess upper incisors, deciduous antlers or horns and preorbital glands. But they do possess three chambered stomach. Family Tragulidae is represented by a single species under the genus *Moschiola* viz. *Moschiola meminna* Erxleben in Karnataka State.

*94. ***Moschiola meminna*** (Erxleben)

1777. *Moschus meminna* Erxleben, *Syst. Regn. Anim., Mamm.* : 322.

2008. *Moschiola meminna* : Nameer, P. O., *Zoos' Print*, **XXIII** (8) : 10.

Common Name : Indian chevrotain or Mouse Deer.

Diagnostic Characters : Same as mentioned for the family, these deers have four well developed toes on each foot. A tiny little deer with high hindquarters. Its coat is olive-brown minutely speckled with yellow. The flanks are marked with characteristic rows of buff or white spots, which elongate and pass into longitudinal bands. Ventral side is always white.

Locality : Sightings reported from Nagarhole, Bandipur, Kudremukh National park by ZSI survey parties in Karnataka State (Karanth, 1986; Pradhan and Kurup, 2001; Palot and Radhakrishnan, 2007).

Habitat : Terrestrial, small sized shy creature preferring to live in thick forest.

Distribution : Peninsular India.

Status : Reported from many localities in Peninsular India, IUCN Criteria as per the CAMP Report (1998) : Lower risk-near threatened (National), Data Deficient (Global), Indian Wildlife (Protection) Act (1972) as amended upto 2006), Schedule : Schedule I Part I.

Source : Karanth, 1986; Corbet and Hill (1992); Pradhan and Kurup, 2001; Alfred *et al.* (2002, 2006b), Menon (2003); Palot and Radhakrishnan, 2007and Wilson and Reeder (2005).

Family CERVIDAE

Subfamily CERVINAE

Medium sized deers possessing deciduous antlers in males, post-orbital gland and four chambered stomach. No incisors in upper jaw. Three genera of Subfamily *Cervinae* of a family *Cervidae* occurs in Karnataka State.

Key to the genera of the subfamily CERVIDAE

1. Upper canines tusk-like, in males; antlers short,

consisting of a short brow-tine and an unbranched beam ..... *Muntiacus*

– Upper canines when present, not tusk-like; antlers long and branched 2

2. Body distinctly spotted; brow-tine set at right angles to the beam of antlers..... *Axis*

– Body unspotted; brow-tine forms an acute angle with the beam of antlers ..... *Rusa*

Genus ***Axis***

Species *Axis axis* (Erxleben) represents Genus *Axis* in Karnataka State.

*95. ***Axis axis*** (Erxleben)

1777. *Crevus axis* Erxleben, *Syst. Regn. Anim.* : 312.

2008. *Axis axis*: Nameer, P. O., *Zoos' Print*, **XXIII** (8) : 10.

Common Name : Chital, Spotted Deer.

Diagnostic Characteristic : Coat bright rufous-fawn, profusely spotted with white, at all ages and seasons, antlers with three tines, a long brow-tine set nearly at right angles to the beam; latter divides into two branches.

Locality : Sighting reported in from Bandipur, Nagarhole, Dandeli in Karnataka State by ZSI survey parties (Karanth, 1986; Pradhan and Kurup, 2001).

Habitat : Terrestrial, diurnal, prefers to stay in grassy forest glades and shaded streams, generally seen in herds of 10-30 with one or two stags.

Distribution : Throughout India.

Status : Abundant populations reported from number of localities, IUCN Criteria proposed as per CAMP Report (1998) : Lower risk-least concern (National), Data Deficient (Global); Indian Wildlife (Protection) Act, 1972 (as amended upto 2002) : Schedule IV.

Source : Agrawal *et al.* (1992), Corbett and Hill (1992); Pradhan and Kurup (2001); Alfred *et al.* (2002), Menon (2003) and Wilson and Reeder (2005).

Remarks : Wilson and Reeder (1993, 2005) have included Genera *Axis* and *Cervus* in subfamily *Cervinae* under family *Cervidae* on the basis of the revisionary studies carried out by Whitehead (1972) and Groves and Grub (1987). Spotted deers are involved in large scale illegal trade, hunting and poaching at domestic as well as international level, mostly for skin and other body parts and also for antlers for making trophies (Pradhan, 1997).

Genus ***Rusa***

Only One species of Genus *Rusa* occurs in Karnataka State.

*96. ***Rusa unicolor*** Kerr

1792. *Cervus axis unicolor* Kerr, *Anim. Kingd.* : 300.

2008. *Rusa unicolor*: Nameer, P. O., *Zoos' Print*, **XXIII** (8) : 10.

Common Name : Sambar.

Diagnostic Characters : Largest of the Indian deer, height at shoulder about 159 cm., coat coarse and shaggy, mane present in stags, covering neck and throat, each antlers with 3 tines, brow antler forming an acute angle with beam, colour brown dorsally with yellowish or grayish tinge, ventral side paler.

Locality : Sighting reported from Bandipur, Nagarhole, Kudremukh National Park in Karnataka State by ZSI Survey parties (Karanth, 1986; Pradhan and Kurup, 2001; Palot and Radhakrishnan, 2007).

Habitat : Terrestrial, preferring to live in thickly wooded forest, diurnal in habit.

Distribution : Throughout India.

Status : Many populations have been reported from number of localities, IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-least concern (National) and Data Deficient (Global); Indian Wildlife (Protection) Act, 1972 (as amended upto 2006) Schedule: Schedule : III.

Source : Karanth (1986), Agrawal *et al.* (1992), Corbet and Hill (1992), Pradhan and Kurup (2001); Alfred *et al.* (2002), Menon (2003) and Wilson and Reeder (2005).

Remarks : Ellerman and Morrison-Scot (1951), Corbet and Hill (1992) placed this species under the genus *Cervus*. However, Wilson and Reeder (2005) retained generic name, *Rusa*. Same view has been followed in the present paper. Sambars are involved in large scale illegal trade, hunting and poaching at domestic as well as international level, mostly for skin and other body parts and also for antlers for making trophies (Pradhan, 1997).

Genus ***Muntiacus***

Genus *Muntiacus* is represented in Karnataka State by a single species, *Muntiacus muntjack*.

*97. ***Muntiacus muntjack*** (Zimmerman)

1780. *Cervus muntjack* Zimmerman, *Geogr. Gesch. Mensch. Vierf. Thiere,* **2** : 131.

2008. *Muntiacus muntjack* : Nameer, P.O., *Zoos' Print*, **XXIII** (8) : 10.

Common Name : Indian muntjak, Barking deer, Rib-faced deer.

Diagnostic Characters : Upper canines tusk like in males, antlers short and unspotted coat slightly darker in colour. Dorsum reddish chestnut, while venter whitish in colour. Heavy bodied deer with short dainty legs. Body fur soft and glossy. Male with a pair of short antlers arising from two skin covered bony pedicles which extend down on either side of the face as bony ridges.

Locality : Sighting reported from Bandipur, Nagarhole, Bramhagiris, Kudremukh in Karnataka state by ZSI Survey parties (Karanth, 1986; Pradhan and Kurup, 2001; Palot and Radhakrishnan, 2007).

Habitat : Terrestrial, any thickly wooded forest including moist mixed deciduous, diurnal in habit.

Distribution : Almost throughout the country excluding Jammu and Kashmir.

Status : Fragmented populations reported from selected localities; IUCN Criteria proposed as per CAMP Report (1998) : Lower risk-least concern (National), Data Deficient (Global); Indian Wildlife (Protection) Act, 1972 (as amended upto 2006) : Schedule III.

Source : Prater (1980), Karanth (1986), Corbet and Hill (1992), Alfred *et al.* (2002), Menon (2003) and Wilson and Reeder (2005).

Remarks : Wilson and Reeder (1993) have reported number of subfamilies under the Family *Cervidae* on the basis of the revisionary work carried out by Whitehead (1972) and Groves and Grab (1987), but Genus *Muntiacus* was included in subfamily *Muntiacinae*. However, Wilson and Reeder (2005) in the revised edition retained this genus under the subfamily *Cervinae*. Barking deers are also involved in illegal trade, hunting and poaching at domestic level, mostly for skin and other body parts such as meat and also for antlers for making trophies (Pradhan, 1997).

Family BOVIDAE

The bovid species possess permanent horns; usually in both sexes, consisting of bone cores with sheaths of horn, no incisors or canines in upper jaw, stomach with four chambers. Family *Bovidae* is represented by two subfamilies, *Antilopinae* and *Bovinae* in Karnataka State.

Key to the subfamilies of family BOVIDAE

– Permanent horns with annular rings spirally twisted ..... ANTILOPINAE

– Permanent horns may be curved or straight but never twisted ..... BOVINAE

Subfamily ANTILOPINAE

Subfamily *Antilopinae* represented by two genera and species in Karnataka State

Key to genera and species of the subfamily ANTILOPINAE

– Shoulder height of male about 74-83cm.; Horns in males, when fully grown, fairly long. Horns circular, in cross section .... *Antelope cervicapra*

– Shoulder height of male about 52-65cm.; Horns in males, when fully grown, fairly short; Horns flat in cross section .... *Gazella bennettii*

Genus *Antilope*

98. *Antilope cervicapra* (Linnaeus)

1758. *Capra cervicapra* Linnaeus, *Syst. Nat.* 10th ed. **I** : 69.

2008. *Antilope cervicapra*: Nameer, P. O., *Zoos' Print*, **XXIII** (8) : 10.

Common Name: Blackbuck or Indian Antilope.

Diagnostic Characters : Adult males blackish brown dorsally, with white on throat and the ventrum. Males with long spiraled horns; Females yellowish fawn above, white below and hornless; Head and Body length about 120-130 cm; Height at shoulder 74-83 cm. Tail short in the range of 16-18 cm.

Locality : Reported from north and south plateau, Naganapura, Ranebennur, in Karnataka state (Karanth, 1986).

Habitat : Largely terrestrial, gregarious and social animal preferring to live in open plains covered with scrub or cultivations. They may enter open forests, which contain vast expanses of grass. It is a diurnal and silent animal found in a herd of 20-30 individuals.

Distribution : Throughout the drier parts of peninsular India except in North-East India.

Status : IUCN Criteria proposed as per the CAMP Report (1998): Lower risk-Least concern (Nationally), Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule I Part I, CITES Appendix: III (Nepal).

Source : Karanth (1986), Corbet and Hill (1992), Alfred *et al.* (2002, 2006b), Menon (2003) and Wilson and Reeder (2005).

Remarks : Blackbuck is hunted for its meat for food, skin and body parts for various purposes including making trophies (Pradhan, 1997). Threats to the survival of the species are also due to habitat destructions, human interference and domestic commercial trade.

99. *Gazella bennettii* (Sykes)

1831. *Antelope bennettii* Sykes, *Proc. Zool. Soc. 1830-31*: 104.

2008. *Gazella bennettii*: Nameer, P. O., *Zoos' Print*, **XXIII** (8) : 10.

Common Name: Indian Gazelle or Chinkara.

Diagnostic Characters : Slender bodied antelope with horns in males relatively longer than in females; The horns are sinuous and closely ringed; Head and body length about 100cm; Height at shoulder ranges between 52-65cm; Dorsum sandy brown to light chestnut with white under parts. Tail medium in length and covered with a dorsal crest of black hairs.

Locality : Reported from north plateau, Sandur in Karnataka state (Karanth, 1986).

Habitat : Inhabits plains and low hills preferring to live in thinly covered dry forested and rocky scrub covered areas.

Distribution : North-western and Central India, including the Thar desert in Rajasthan and Gujarat extending southwards to a little south of the Krishna river.

Status : IUCN Criteria proposed as per the CAMP Report (1998): Lower risk-Least concern(National) and Data Deficient (Global); Indian Red Data Book (1994) : Vulnerable; Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule I Part I, CITES Appendix: Not listed.

Source : Karanth (1986), Corbet and Hill (1992), Alfred *et al.* (2002, 2006b), Menon (2003), Wilson and Reeder (2005).

Remarks : Chinkara is hunted for its meat for food and skin and body parts for various purposes including making trophies (Pradhan, 1997). Threats to the survival of the species are also due to habitat destructions, human interference and domestic commercial trade.

Subfamily BOVINAE

Only three genera under Subfamily *Bovinae* have been recorded from the Karnataka state.

Key to the genera of Subfamily BOVINAE

1. Two pairs of short horns in males. Small-sized

antelope with height at shoulder under 65 cm ..... ***Tetracerus***

– Only one pair of strong horns in males or in both sexes. Large-sized with height above 100 cm 2

2. Tail with terminal tuft; Females with horns; A prominent muscular dorsal ridge present on the shoulders ..... ***Bos***

– Tail without terminal tuft; Females without horns; A prominent muscular dorsal ridge absent on the shoulders ..... ***Boselaphus***

Genus ***Bos***

Only one species under genus *Bos* has been reported from Karnataka State.

*100. ***Bos gaurus*** Smith

1827. *Bos gaurus* H. Smith, *Griffith's Cuvier Anim. Kingd.* **4** : pl. Opposite p. 399.

2008. *Bos gaurus* : Nameer, P. O., *Zoos' Print*, **XXIII** (8) : 10.

Common Name : Indian Gaur.

Diagnostic Characters : Gaur is a robust animal with height at shoulders in males in the range of 175-200 cm and possessing a pair of permanent horns in both the sexes. Gaur horn bases are wide apart and cross section of the horn is always round or oval. The horn consists of unbranched bone core with a sheath. Gaur possesses huge head, deep massive body and sturdy limbs. Ears large and broad. A prominent muscular dorsal ridge present on the shoulders, which slopes down to the middle of the back where it ends in an abrupt dip. Being a member of the bovid family upper incisors absent, and diastema between incisors and cheek-teeth long. Tail with terminal tuft of hairs. The general body colour coffee or reddish brown or jet black in old bulls and ashy forehead with yellowish or whitish stockings. Calves always lighter in colour, while adult female blackish brown in colour. Stomach complex and divided into four chambers. In hot weather much of the hair is shed.

Locality : ZSI Survey parties reported sightings in Bandipur, Nagarhole, Kudremukh and Dandeli in Western Ghats and southern plateau in Karnataka State (Karanth, 1986; Pradhan and Kurup, 2001; Palot and Radhakrishnan, 2007).

Habitat : A typical thickly wooded hills are the favorite haunts of Gaur in India. Largely terrestrial preferring to live in all types of forests and jungles. They can go even beyond the altitude of 6000 Ft. They are fairly diurnal in habit. They are seen generally in herds. They keep to more or less thick jungle and come out to graze in open or outskirts of the forest. Gaur is by nature shy and timid animal.

Distribution : North-east India, duars of West Bengal, Bihar, Orissa and Peninsular India.

Status : Fragmented populations have been reported from isolated localities; IUCN Criteria proposed as per the CAMP Report (1998) : Vulnerable (National) and Data Deficient (Global), Indian Wildlife (Protection) Act (1972, as amended unto 2006) Schedule : Schedule I Part I, Red Data Book, National (1994): Vulnerable, CITES Appendix: I.

Source : Corbet and Hill (1992), Alfred *et al.* (2006), Menon (2003), Wilson and Reeder (2005) and Alfred *et al.* (2006b).

Remarks : Peter Grubb in Wilson and Reeder (1993 and 2005) has included *Bos gaurus* in *Bos frontalis*. However, *Bos gaurus* has been retained here based on the comments given in Corbet and Hill (1992). Alfred *et al.* (2006a,b) and Nameer (2008) have also followed the same views. Gaur is hunted for its meat for food and body parts for various purposes including making trophies. Threats to the survival of the species are also due to habitat destructions, human interference and domestic as well as international commercial trade (Pradhan, 1997).

Genus ***Boselaphus***

101. ***Boselaphus tragocamelus*** (Pallas)

1766. *Antilope tragocamelus* Pallas, *Misc. Zool.* : 5.

2008. *Boselaphus tragocamelus* : Nameer, P.O., *Zoos' Print*, **XXIII** (8) : 10.

Common Name : Blue Bull, Nilgai.

Diagnostic Characters : Horse-like in build, higher shoulder sloping downwards to a low rump; Body colour in males iron-grey and in females sandy brown; A distinctive tuft of stiff black hairs present on the throat of males; Height at shoulder 130-150 cm.

Locality : Occurrence of this species in the past in south and northern plateau in Karnataka State (Karanth, 1986).

Habitat : Largely terrestrial animal preferring to live in dry deciduous and thorn forest. However, they avoid dense forests and move around in hills sparsely dotted with trees, or on undulating or level plains covered with grass and patches of scrub. They freely enter in crop fields and are source of damage to the standing crops. Though Blue Bulls are social in habit, they do not regularly congregate in large herds. Nilgai can survive without water for long periods.

Distribution : Peninsular India including Karnataka.

Status : IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Least concern (National), Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule : Schedule III.

Source : Karanth (1986), Corbet and Hill (1992), Menon (2003), Wilson and Reeder (2005) and Nameer (2008).

Remarks : Nilgai is hunted for its meat for food and body parts for various purposes including making trophies. Threats to the survival of the species are also due to habitat destructions, human interference and domestic as well as international commercial trade (Pradhan, 1997).

Genus ***Tetracerus***

Only one species under genus *Tetracerus* has been reported from Karnataka State.

102. ***Tetracerus quadricornis*** (Blainville)

1816. *Cerophorus (Cervicapra) quadricornis* Blainville, *Bull. Soc. philom.* Paris : 75 & 78.

2008. *Teracerus quadricornis* : Nameer, P.O., *Zoos' Print*, **XXIII** (8) : 11.

Common Name : Four-horned antelope, Chousingha.

Diagnostic Characters : Presence of four horns (second pair on the forehead is comparatively much smaller), absence of rings on the horns, which are keeled in front, and presence of a pair of well-developed glands between the false hooves of the hind legs in both the sexes are the characteristic features of the species. Coat colour dull red-brown dorsally and white ventrally with dark stripe down the front of each leg.

Locality : Reported from Bandipur, Nagarhole, Sandur in Western Ghats and southern plateau in Karnataka State (Karanth, 1986; Pradhan and Kurup, 2001).

Habitat : Terrestrial, well wooded and watered undulating terrain with dry deciduous forests, also found in transition zone between scrub and the forests, diurnal in habit.

Distribution : Throughout India excluding northeast region.

Status : Fragmented populations reported from isolated localities; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-near threatened (National) and Data Deficient (Global); Indian Wildlife (Protection) Act 1972 (as amended upto 2006) : Schedule : Schedule I Part I; Red Data Book (1994) (National) : Vulnerable; Red Data Book (1996) (International) : Vulnerable.

Source : Karanth (1986), Corbet and Hill (1992), Alfred *et al.* (2002, 2006b), Menon (2003) and Wilson and Reeder (2005).

Remarks : Corbet and Hill (1992) placed this species under the family Bovidae without distinction of any subfamily. Ellerman and Morrison-Scott (1951), and Wilson and Reeder (1993 and 2005) recognized the subfamily Bovinae. Same view has been followed in the present paper.

Order PHOLIDOTA

Order Pholidota is represented by the animals with upper part of body covered with large, overlapping scales or scutes. undersurface clothed

with coarse bristle like hairs. Snout long and narrow with long sticky tongue. The order contains a single family.

Family MANIDAE

Family Manidae is represented by only one genus *Manis* with a single species *M. crassicaudata* Gray within Karnataka state.

103. ***Manis crassicaudata*** Gray

1828. *Manis crassicaudata* Gray, in *Griffith's Cuvier Animal. Kingd.*, **5** : 282.

2008. *Manis crassicaudata* : Nameer, P. O., Zoos' Print, **XXIII** (8) : 8.

Common Name : Indian Pangolin.

Diagnostic Characters : Hump-backed body, tapering tail without glandular naked area at the tip. Muzzle tapering to a narrow, downwardly curving trunk like snout. External pinna like a shallow, crescent-shaped vertical folds. Body covered with 11-13 rows of overlapping light yellowish brown, pointed scales or scutes.

Locality : Mysore and Bangalore districts (Karanth, 1987); Bandipur National Park in Karnataka (Menon, 2003).

Distribution : Peninsular India (Corbet and Hill, 1992 and Chakrborty *et al.*, 2002).

Status : Agrawal *et al.* (1992) have reported the status of the species as rare in peninsular India. IUCN criteria proposed as per CAMP Report (2005) : Vulnerable (National and South Asia), Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: I Part: I, CITES: Appendix: II, Red Data Book (National, 1994) : Vulnerable..

Source : Corbet and Hill (1992), Chakrborty *et al.* (2002), Wilson and Reeder (2005) and Alfred *et al.* (2006b).

Remarks : Recent status survey study of *Manis crassicaudata* was carried out by Chakrborty *et al.* (2002). The species is known to be hunted for domestic trade of body parts for medicinal and other usage (Pradhan, 1997).

Order RODENTIA

Order Rodentia is characterized by presence of a pair of ever growing chisel-shaped incisors in each jaw and a distinct diastema (Open space) between incisors and cheek teeth (Molars).

Order Rodentia is represented by three suborders in Karnataka State.

Key to the suborders of RODENTIA

1. Fur modified into quills or long stiff hairs.. ..... HYSTRICOMORPHA
– Fur normal and not modified into quills or long stiff hairs 2
2. Cheek teeth 3/3 ..... MYOMORPHA
– Cheek teeth, except in Genus *Ratufa*, 5/4 in number ..... SCIUROMORPHA

Suborder SCIUROMORPHA

Suborder Sciuromorpha is represented by a single family, Sciuridae in Karnataka State.

Family SCIURIDAE

Family Sciuridae is represented by three subfamilies in Karnataka State. All types of squirrels belong to the Family Sciuridae.

Key to the Subfamilies of SCIURIDAE

1. Flying membrane present on both side of the body ..... SCIURINAE
– Flying membrane totally absent 2
2. Small-sized squirrel, head and body length always below 280 mm; dorsal surface of the body with stripes ..... CALLOSCIURINAE
– Large-sized squirrel, head and body length over 280mm; dorsum without any stripe on the body ..... RATUFINAE

Subfamily CALLOSCIURINAE

Subfamily Callosciurinae is represented by single Genus in Karnataka State.

Genus ***Funambulus***

Four species of the Genus *Funambulus* occur in Karnataka State.

Key to the species of *Funambulus*

1. Dorsal pelage with five longitudinal light stripes ..... *Funambulus pennantii*

– Dorsal pelage with three longitudinal light stripes 2

2. Occipitonasal length usually exceeding 40 mm; length of palate (front of incisors to back of palate) usually exceeding half of the occipitonasal length .... *Funambulus tristriatus*

– Occipitonasal length usually less than 40 mm; length of palate usually less than half of occipitonasal length 3

3. Occipitonasal length usually exceeding 36 mm ..... *Funambulus palmarum*

– Occipitonasal length usually less than 36 mm ..... *Funambulus sublineatus*

Species ***Funambulus palmarum***

Three striped palm squirrel *Funambulus palmarum* is represented by only the nominate subspecies in Karnataka state.

*104. ***Funambulus palmarum palmarum*** (Linnaeus)

1766. *Sciurus palmarum* Linnaeus, *Syst. Nat.* 12th ed., **1** : 86.

2002. *Funambulus palmarum palmarum*: Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.* **199** : 175-176.

Common Name: Indian Palm Squirrel.

Diagnostic Characters **:** Head and Body length in the range of 117-178mm. Tail length range 113-176 mm. In majority of specimens, it is longer than Head and Body length. Hind foot in the range between 29.0-41.0mm. Dorsal median stripe narrower than the laterals. Longitudinal dorsal stripes creamy white in colour. Forehead brown grizzling prominently. Anterior portion of dorsal saddle generally with blackish brown tinge, which extends up to the root of the tail. Tail black and white, orange rufous line running down the center. Occipitonasal length in the range of 37.3-40.2 mm. Nasal and frontals less than 30% of occipitonasal length. Upper incisors narrow, reddish or yellow and plain. Five upper cheek teeth. Upper toothrow in the range of 6.8-7.9 mm.

Locality : Reported from Vijaynagar, Bellary; Dharwar, Kolar and Seringapatanam in Karnataka State (Agarwal & Chakraborty, 1979a,b); one specimen was collected from Bandipur Tiger Reserve, Karnataka (ZSI, WRC; M/482).

Habitat : Thin forest cover.

Status : IUCN Criteria proposed as per the CAMP Report (2005): Least Concern (For *Funambulus palmarum*).

Source : Ellerman (1961), Corbet and Hill (1992), Wilson and Reeder (2005), Pradhan and Kurup (2001), Alfred *et al.* (2002), Nameer (2008).

Remarks : *Funambulus palmarum bellaricus* Wroughton reported from central and northern part of Western Ghats in Karnataka and Maharashtra states has been synonymised under the nominate subspecies *Funambulus palmarum palmarum* on the basis of insignificant colour variations (Wilson and Reeder, 2005). However, recently Talmale (2007) also found colour variations within the specimens of *F. p. bellaricus* from Kolar and Srirangapatanam (Karnataka) and Kolhapur (Maharashtra) regions.

Species ***Funambulus tristriatus***

Jungle striped squirrel *Funambulus tristriatus* is represented by two subspecies in Karnataka State.

Key to the subspecies of *Funambulus tristriatus*

– Larger size; Hind foot length 40 mm and above; Occipetonasal length averages above 42 mm; Upper Molar toothrow 8 mm and above ..... *Funambulus tristriatus tristriatus*

– Smaller size; Hind foot length below 40 mm; Occipetonasal length averages below 42 mm; Upper Molar toothrow below 8 mm. .... *Funambulus tristriatus numarius*

*105. ***Funambulus tristriatus tristriatus*** (Waterhouse)

1837. *Funambulus tristriatus* Waterhouse, *Mag. Nat. Hist. (Charlesworth's),* **1** : 499.

2002. *Funambulus tristriatus tristriatus* : Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.* **199** : 177.

Common Name: Jungle striped squirrel.

Diagnostic Characters : Large sized jungle striped squirrel with Head and Body length Head and Body length in the range of 140-210 mm. Tail bushy and shorter than Head and Body length in the range of 136-181mm. Length of Hind foot 40 mm and above. Infraorbital foramen scarcely open for muscle transmission. There are three pale yellow longitudinal strips, middle one being much shorter and narrower than the lateral ones. Saddle rich chestnut; under parts usually white or whitish or buff coloured. The inguinal region, testis and mid-ventral line of the tail is red or from cadmium orange to saturn red in colour. Occipitonasal length averages 42mm and above (Ellerman, 1961); Upper molar toothrow (2 premolars and 3 molars) 8 mm and above.

Locality : Reported from Haleri, Wotekolli, Srimangala, Makut, Virajpet in North and South Coorg, Nilgiri Biosphere Reserve (Sighting reported by ZSI Survey Parties) in Karnataka State (Ellerman, 1961; Agrawal and Chakraborty, 1979a,b; Pradhan and Kurup, 2001).

Habitat : Arboreal and diurnal preferring to live in semi-dense forests close to human habitations. Though mostly arboreal, they come quite often on the ground. They are in habit of constructing nests in tree holes. They are basically shy in nature.

Distribution : Kerala State in Western Ghats.

Status: Species endemic to India; IUCN Criteria proposed as per the CAMP Report (2005): Near Threatened (For *Funambulus tristriatus*).

Source : Ellerman (1961), Prater (1980), Corbet and Hill (1992), Pradhan and Kurup (2001), Wilson and Reeder (2005), Alfred *et al.* (2002) and Menon (2003).

Remarks : *Funambulus tristriatus wroughtoni* Ryley reported from South Coorg (Karnataka) and Kerala in Western Ghats has been synonymised with nominate subspecies *Funambulus tristriatus tristriatus* (Wilson and Reeder, 2005). Indian striped squirrel species are hunted for meat for food and skin and body parts for various purposes including making trophies (Pradhan, 1997). Threats to the survival of the species are also due to habitat destructions and isolation, human interference and domestic commercial trade.

*106. ***Funambulu**`ghton

1916. *Funambulus tristriatus numarius* Wroughton, *J. Bombay nat. Hist. soc.*, **24** : 646.

1992. *Funambulus tristriatus numarius*: Corbet and Hill, *The Mammals of the Indomalayan region* : 281.

Common Name: Jungle striped squirrel.

Diagnostic Characters : Small sized jungle striped squirrel with Head and Body length ranges between 140-174 mm. Tail bushy with hairs are black with white tips. It is shorter than Head and Body length in the range of 124-175mm. Three longitudinal pale buff stripes, broader and better marked than the *F. t. tristriatus*. Face coloured like the back with a yellow suffusion, cheeks buff in colour. Colour of saddle becomes jet black. The inguinal region, testis and mid-ventral line of the tail is a bright cinnamon rufous in colour. Hind foot length below 40mm. Occipitonasal length averages below 42mm (Ellerman, 1961).

Locality : Reported from Gersoppa, Hulekal near Sirsi, Kanara, Dharwar, Potoli, Devikop, Shimoga, in Karnataka State (Ellerman, 1961; Moore and Tate, 1965; Agrawal and Chakraborty, 1979a,b).

Habitat : Arboreal and diurnal preferring to live in semi-dense forests close to human habitations. Though mostly arboreal, they come quite often on the ground. They are in habit of constructing nests in tree holes. They are basically shy in nature.

Distribution : Maharashtra and Goa States in northern part of Western Ghats.

Status : Species endemic to India; IUCN

Criteria proposed as per the CAMP Report (2005): Near Threatened (For *Funambulus tristriatus*).

Source : Ellerman (1961), Moore and Tate (1965); Corbet and Hill (1992), Wilson and Reeder (2005).

Remarks : Earlier Ellerman and Morrison-Scott (1951) and Ellerman (1961) kept *Funambulus tristriatus numarius* Wroughton under nominate subspecies *Funambulus tristriatus tristriatus* (Waterhouse) due to overlapping of characters within these races. Agrawal and Chakraborty (1979a) also supported Ellerman's view. Later, Moore and Tate (1965) maintained *numarius* as a distinct subspecies of *F. tristriatus*. Corbet and Hill (1992) and Wilson and Reeder (2005) also followed the same view.

Species ***Funambulus sublineatus***

Dusky striped squirrel *Funambulus sublineatus* is represented by an only nominate subspecies in Karnataka state.

107. ***Funambulus sublineatus sublineatus*** (Waterhouse)

1838. *Sciurus sublineatus* Waterhouse, *Proc. Zool. Soc. London*, **1838** : 19.

2002. *Funambulus sublineatus sublineatus* : Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.* **199** : 176.

Common Name: Dusky Palm Squirrel.

Diagnostic Characters : Coat speckled with dull greenish grey. Under parts dull brown. Dorsal side possesses three pale stripes alternating with four dark longitudinal stripes. Head and body length in the range of 110-130 mm and tail length 106-135 mm. Occipitonasal length ranges between 33.0-35.4 mm (Ellerman, 1961). Under parts drab dull brownish, often little lighter than the back.

Locality : Reported from Kutta, Coorg; Kotagiri, Ootacamund, Nilgiri Hills, Karnataka State (Ellerman, 1961; Moore and Tate, 1965.

Habitat : It prefers country side with light rainfall. It is quite common upto 5000 ft. (Moore and Tate, 1965).

Distribution : Kerala, Tamil Nadu in Western Ghats.

Status : Not very uncommon in the region; IUCN Criteria proposed as per the CAMP Report (2005): Endangered (National), Vulnerable (South Asia).

Source : Ellerman (1961), Moore and Tate (1965), Corbet and Hill (1992), Alfred *et al.* (2002), Menon (2003) and Wilson and Reeder (2005).

Remarks : Nil

Species ***Funambulus pennantii***

Indian five striped northern palm squirrel *Funambulus pennantii* is represented an only nominate subspecies in Karnataka state.

*108. ***Funambulus pennantii pennantii*** Wroughton

1905. *Funambulus pennanti* Wroughton, *J. Bombay N. H. Soc.,* **16** : 411.

2004. *Funambulus pennantii pennantii*: Srinivasulu, Chakraborty and Pradhan, *Zoos' Print Journal*, **19** (2) : 1354.

Common Name: Indian five striped Northern Palm Squirrel.

Diagnostic Characters : Indian five striped squirrel possesses Head and Body length never over 200 mm, molars four in number and tail always long and bushy (Range 130-180 mm). The back has five bold light coloured stripes on the dorsal surface with under parts usually white or whitish or buff coloured. There are three median pale stripes and one pale stripe on the flanks on each side. Underside of the tail without red or reddish line running down the centre. Dorsum brownish or grayish. The stripes are long and mid-dorsal stripe light but prominent. Baculum simple and not bifurcated. Two pairs of mammary teats present.

Locality : Reported from Dharwad, Karnataka State (Ellerman, 1961; Moore and Tate, 1965). Also sighted within the limits of Belgaum and Dharwad cities by ZSI survey parties during NBR Surveys.

Habitat : Arboreal and diurnal preferring to live close to the human habitations. Five striped squirrel is more commensal species than the three striped species. Five striped squirrel is more common in North India (Its southern limit being Dharwad in Karnataka State). Though arboreal, they come more frequently on the ground. They are in habit of constructing nests in tree holes.

Distribution : North, North-East and Central India and also in Western Ghats.

Status : IUCN Criteria proposed as per the CAMP Report (2005): Least concern (For *Funambulus pennantii* , National), Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule : IV.

Source : Ellerman (1961), Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Alfred *et al.* (2002) and Talmale (2007).

Remarks : Number of subspecies have been described on the basis of pelage colour variations seen in the species by some authors. However, *Funambulus pennanti* Wroughton has been described as a single species on the basis of Ellerman (1961), Corbet and Hill (1992) and Agrawal *et al.* (1992). Wilson and Reeder (2005) maintained only two subspecies *F. pennantii pennantii* and *F. p. argentescens* within species range. Indian squirrel is hunted for its meat for food and skin and body parts for various purposes including making small trophies and some other articles like brushes etc (Pradhan, 1997). Threats to the survival of the species are also due to habitat destructions and isolation, human interference and domestic commercial trade.

Subfamily RATUFINAE

Genus ***Ratufa***

Two species of the genus *Ratufa* occurs in Karnataka State.

Key to the species of *genus Ratufa*

– Occipitonasal length reaches upto 70 mm; Hind limbs are pale, like the under parts; Grizzled dorsal pelage ..... *Ratufa macroura*

– Occipitonasal length reaches upto 81 mm; Hind limbs are dark like the back; Dorsal pelage normal and not grizzled .... *Ratufa indica*

Species ***Ratufa macroura***

Grizzled Giant squirrel, *Ratufa macroura*, is represented in Karnataka State by only one subspecies

109. ***Ratufa macroura dendolena*** Thomas and Wroughton

1915. *Ratufa macroura dendolena* Thomas and Wroughton, *J. Bombay nat. Hist. Soc.*, **24** : 36.

2002. *Ratufa macroura dendolena* : Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.* **199** : 179.

Common Name: Grizzled Indian Giant squirrel.

Diagnostic Characters : Dorsal surface and tail brownish grey, grizzled with white in colour. Under parts, cheeks, patch of neck, arms and legs buffy white. Both its ears and head are dark brown or black. Head and body length 290-400 mm. Tail length 300-400 mm. Occipitonasal length in the range of 62.2-67.2 mm.

Locality : Reported from Cauvery Wildlife Sanctuary; Kanakapura and Kollegala taluka in southern Karnataka (Kumara and Singh, 2006).

Habitat : Restricted to riverine forests, specially wherever the trees were tall and widespread;

Distribution : Western Ghats in Kerala and Tamil Nadu.

Status : IUCN Criteria proposed as per the CAMP Report (2005): Endangered (For *Ratufa macroura*); Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule II Part II, CITES Appendix: II.

Source : Ellerman (1961), Prater (1980), Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Alfred *et. al.* (2002, 2006b), Menon (2003) and Kumara and Singh (2006).

Species ***Ratufa indica***

Indian Giant squirrel, *Ratufa indica,* is represented in Karnataka State by two subspecies

with considerable amount of over-lapping in distribution and intergradations. Many a times they share same ecological zone. Even overlapping in coloration pattern can mislead to wrong identification of the subspecies in the field.

Key to the Subspecies of *Ratufa indica*

– Half of the forelimbs and distal almost half portion of the tail creamish white coloured; Cream colour on the forelimb does not extend upto neck ..... *Ratufa indica indica*

– More than half portion of the forelimbs and only terminal portion of the tail creamish white coloured; Cream colour on the forelimb extends upto neck ..... *Ratufa indica maxima*

*110. ***Ratufa indica indica*** (Erxleben)

1777. *Sciurus indica* Erxleben, *Syst. Regn. Anim.,* **1** : 420.

2002. *Ratufa indica indica* : Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.* **199** : 179.

Common Name : Indian Giant Squirrel.

Diagnostic Characters : Indian giant squirrel has body size large over 280 mm in head and body length (Max. 470 mm), molars four in number and tail usually long and bushy (Around 600 mm). Dorsum deep red, while venter light buff or yellowish in colour. Tail dark proximally. However, almost half the distal part of the tail paler in colour. Ears red with small tuft of hairs. Forelegs blackish red in colour.

Locality : Reported from Samasgi, South west of Dharwar; Devikop; Yellapur, North Kanara in Karnataka State (Ellerman, 1961; Moore and Tate, 1965; Agarwal & Chakraborty, 1979).

Habitat :Giant squirrels live only in thick forests of different types and, hence, is considered as indicator species. It is an arboreal and diurnal species. They keep to the canopies and seldom come on the ground. They move from tree top to tree top taking amazing leaps with limbs outspread, covering as much as twenty feet in a single flight. They are in habit of constructing number of nests on the tree tops. They are shy and wary animals and not so easy to locate. Despite its brilliant colouring they are sooner heard than seen.

Distribution : Thick forested areas of northern Western Ghats.

Status : Endemic to India; IUCN Criteria proposed as per the CAMP Report (2005): Vulnerable; Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule II Part II, CITES Appendix: II,

Source : Ellerman (1961), Prater (1980), Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Alfred *et al.* (2002, 2006b) and Menon (2003).

Remarks : Hoffman Robert S., Anderson C. G., Thorington, R.W. and Heaney, L.R. in Wilson and Reeder (1993) have placed Genus *Ratufa* in the Subfamily *Scuirinae*. However it has been kept under *Ratufinae* here following the comments given in Corbet and Hill (1992) and Wilson and Reeder (2005). Indian giant squirrel is hunted for its meat for food and skin and body parts for various purposes including making trophies (Pradhan, 1997). Threats to the survival of the species are also due to habitat destructions, habitat isolation restricting to few individuals near sacred springs and riverine forests, human interference and domestic as well as international commercial trade.

111. *Ratufa indica maxima (Schreber)

1784. *Sciurus maximus* Schreber, Saugethiere, **4** : 784, pl. 217B.

2002. *Ratufa indica maxima* : Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.* **199** : 179.

Common Name: Indian Giant squirrel.

Diagnostic Characters : Continuous black colour across the shoulders, the black rump, light feet and creamish white tail tip. Ears red with small tuft of hairs. Forelegs blackish red in colour. However, more than half of the forelimbs creamish in colour. The paler colour extends up to neck.

Locality : Coorg, Kutta, Mysore, Ootacamund, Nagarhole National Park (Ellerman, 1961; Moore and Tate, 1965; Pradhan and Kurup, 2001) in Karnataka State.

Habitat :Same as that of previous subspecies.

Distribution : Kerala in Western Ghats.

Status : Endemic to India; IUCN Criteria proposed as per the CAMP Report (2005): Vulnerable (For *Ratufa indica*), Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule II Part II, CITES Appendix: II.

Source : Ellerman (1961), Prater (1980), Corbet and Hill (1992), Wilson and Reeder (1993, 2005) and Alfred *et al.* (2002, 2006b).

Remarks : Earlier *Ratufa indica bengalensis* Blanford was recognized as a separate subspecies by Ellerman and Morrison-Scott (1951) and Ellerman (1961). However Moore and Tate (1965), Corbet and Hill (1992) and Wilson and Reeder (2005) synonymised the same under the subspecies *Ratufa indica maxima*. Same view has been followed here.

Subfamily SCIURINAE

Tribe **Pteromyini**

Subfamily Sciurinae (Flying squirrels) is represented by two genera and species in Karnataka State.

Key to the genera and species of the tribe Pteromyini

– Small flying squirrel; Head and body length upto 300 mm; Occipetonasal length below 60 mm ..... *Petinomys fuscocapillus*

– Large flying squirrel; Head and body length above 300 mm; Occipitonasal length above 60 mm ..... *Petaurista philippensis*

Genus ***Petinomys***

112. ***Petinomys fuscocapillus*** (Jerdon)

1847. *Sciuropterus fuscocapillus* Jerdon in Blyth, *J. Asiat. Soc. Beng.*, **16**, 867.

2006. *Petinomys fuscocapillus* : Alfred, Das and Sanyal, *Animals of India*: *Mammals*. ENVIS-*Zool. Surv. India,* Kolkata : 183.

Common Name : Small Travancore Flying squirrel.

Diagnostic Characters : Flying squirrel is distinctive in possessing gliding membrane on each flank from wrist to ankle. Head and Body length of adult specimen in the range between 190-250 mm. Dorsal colour reddish brown; cheeks and sides of belly white in colour. Tail feather shaped, longer than head and body length, broad and long, bearing a central line of blackish hairs; Occipetonasal length below 60 mm. Toothrow length is less than one-fifth of the occipitonasal length.

Locality : Reported from forests of Brahmagiri-Makut and Pushpagiri-Bisale in Western slope of Western Ghats in Karnataka State (Kumara and Singh, 2006); Habitat: Inhabits evergreen and deciduous forests.

Distribution : India : Kerala and Sri Lanka.

Stauts : IUCN Criteria proposed as per the CAMP Report (2005): Vulnerable (India and Sri Lanka), Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule : Schedule : II Part II.

Source : Ellerman (1961), Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Alfred *et al.* (2002, 2006b), Menon (2003) and Kumara and Singh (2006).

Genus ***Petaurista***

*113. ***Petaurista philippensis*** (Elliot)

1839. *Pteromys philippensis* Elliot, *Madras J. Litt. Sci.*, **10** : 217.

2006. *Petaurista philippensis*: Alfred, Das and Sanyal, *Animals of India*: *Mammals*. ENVIS-*Zool. Surv. India,* Kolkata : 179.

Common Name: Common Giant Flying Squirrel.

Diagnostic Characters : Flying squirrel is distinctive in possessing gliding membrane on each flank from wrist to ankle. Head and Body length of adult specimen in the range between 350-470 mm, tail always longer than Head & Body (Range 400-530mm) and bushy, Hind feet moderately long (72-82 mm) and molars four in number. Dorsally the giant flying squirrel, as a rule, is dark brownish grey or tending to be more grey but without any

reddish tinge and with under parts usually whitish grey or buff coloured. Greater part of the tail black. Two pairs of mammary teats present.

Locality : Reported from Jog and Gersoppa falls, Kanara; Helleri, Srimangala, Kutta, Virajpet, Coorg in Karnataka State (Ellerman, 1961; Agarwal & Chakraborty, 1979b). One pelt was observed in the catchment area of Kabini Reservoir in Nagarhole National Park by ZSI Survey party during NBR surveys (Pradhan and Kurup, 2001).

Habitat : Totally arboreal and nocturnal in habit preferring to live in tropical and temperate forests on plains to those on high altitudes. Contrary to the common name, the flying squirrel does not fly but glides from treetop to treetop in the air. When the animal leaps into the air the outspread limbs expands the gliding membrane between the limbs to the fullest extent. Supported by the membrane the squirrel glides smoothly and swiftly downwards. Flying squirrel can easily be tamed but they are delicate animals and do not live long in confinements.

Distribution : Peninsular India south of Himalaya.

Status : Uncommon in the region; IUCN Criteria proposed as per the CAMP Report (2005): Near Threatened (India) and Endangered (Sri Lanka), Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule : II Part II. .....

Source : Ellerman (1961), Prater (1980), Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Alfred *et al.* (2002, 2006b) and Menon (2003).

Remarks : *Petaurista philippensis* was earlier considered to be a subspecies of *Petaurista petaurista*. However *Petaurista philippensis* has been considered as a valid species by Corbet and Hill (1992) and upheld by Hoffman *et al* in Wilson and Reeder (1993). The flying squirrel is hunted for its meat for food. Threats to the survival of the species are also due to habitat destructions, fragmentation, human interference and domestic trade.

Suborder MYOMORPHA

Superfamily MUROIDEA

Superfamily Muroidea is represented by only two families in Karnataka State.

Key to the families of superfamily MUROIDEA

– Cheek-teeth flat crowned, having transverse ridges ..... PLATACANTHOMYDAE

– Cheek-teeth biserially or triserially cuspidate ..... MURIDAE

Family PLATACANTHOMYDAE

The family Platycanthomydae was, earlier, kept in an erstwhile subfamily, Platacanthomynae, of the family Muridae. Wilson and Reeder (2005) gave the status of family, which includes the single Indian genus and species *Platacanthomys lasiurus* (Malabar Spiny Dormouse).

Genus ***Platacanthomys***

114. ***Platacanthomys lasiurus*** Blyth

1859. *Platacanthomys lasiurus* Blyth, *J. Asiat. Soc. Bengal.*, **28** : 289.

2006. *Platacanthomys lasiurus*: Alfred, Das and Sanyal, *Animals of India*: *Mammals*. ENVIS-*Zool. Surv. India,* Kolkata : 184.

Common Name: Malabar Spiny Dormouse.

Diagnostic Characters : Indian endemic species with dorsum spiny, tail shorter than head and body length and covered with coarse hairs, becoming thick and bushy at its tip. Body colour reddish brown above and whitish on the undersurface. Hallux clawless. Head and body length in the range of 118-138 mm. Tail length 76-104 mm. Skull medium sized with occipitonasal length exceeds condylobasal length. Upper incisors plain, ungrooved, orange and opisthodont. Molars 3/3 in number with flat crowns having transverse ridges. 2 pairs of mammary glands present.

Locality : Agrawal (2000) reported from Shimoga, Mysore-Kanara border and South Coorg in Karnataka State.

Habitat : Occurs in moist evergreen forest in south-western Peninsular India.

Distribution : Kerala in India.

Status : Species endemic to India; IUCN Criteria proposed as per the CAMP Report (2005): Vulnerable, Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule : V (Vermins).

Source : Ellerman (1961), Prater (1980), Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Agrawal (2000) and Alfred *et al.* (2002, 2006a).

Family MURIDAE

Family *Muridae* is represented by only two subfamilies out of five Indian subfamilies in Karnataka State. All types of rats, bandicoots, mice and gerbils belong to the Family *Muridae*

Key to the Subfamilies of MURIDAE

– Upper incisors grooved; molar cusps arranged in two longitudinal rows; Bulla inflated; Tail long with terminal hair tuft ..... GERBILLINAE

– Upper incisors not grooved; molar cusps arranged in three longitudinal rows; Bulla not inflated; Tail long and normal without any terminal hair tuft ..... MURINAE

Subfamily GERBILLINAE

Subfamily *Gerbillinae* (Gerbil Rats) is represented by a single species under Genus *Tatera* in Karnataka State.

Genus ***Tatera***

*115. ***Tatera indica*** (Hardwicke)

1807. *Dipus indicus* Hardwicke, *Trans. Linn. Soc. Lond.*, **8** : 279.

2008. *Tatera indica*: Nameer, P. O., *Zoos' Print*, **XXIII** (8) : 4.

Common Name : Indian Gerbil/Antelope Rat.

Diagnostic Characters : Indian Gerbil Rat has been characterized by possession of clawed hallux, opisthodont yellow and distinctly grooved upper incisors, long anterior palatal foramina, more than 15.0 mm, extending between the tooth row and molars three in number. Tail (157-218 mm) longer than Head and Body length (range between 145-203 mm.) ending in terminal tuft of hairs. Large and soft-furred antelope rat species. Hind foot long and in the range between 40-47 mm. Soles naked upto heel. Nasals unusually long and more than 40% of the occipitonasal length. Upper molar tooth row characteristic with biserially arranged longitudinal cusps. Upper incisors distinctly grooved and usually yellow in colour. Dorsum sandy brown to reddish brown, while under parts white in colour. Tail dark above and below and pale on the sides. Hind feet white in colour. 4 pairs of mammary glands present.

Locality : Agrawal (2000) reported from Dharwar, North Kanara, Bellary, Shimoga, Mysore, Coorg from Karnataka State in southern India. Sighting in Dharwar district recorded by ZSI team during NBR survey.

Habitat : Terrestrial, fossorial and nocturnal rodent species found throughout India. The species is basically a field rat and generally lives in cultivated plains, gardens, orchards pastureland, crop fields, waste lands and forests. Amongst the Indian gerbils, this species appears to be the most adapted ecologically. It makes complex burrows with number of openings covering large areas for the purpose of living, hoarding the food stuff, reproduction and family care. A single burrow system may have separate living chamber, storing chamber, chamber for female and young one etc.

Distribution : Throughout lowland India and Nepal, east to the Ganges delta, West through Pakistan and South Afghanistan, Iran and Iraq to Syria and south to Sri Lanka (Corbet and Hill, 1992).

Status : common; IUCN Criteria proposed as per the CAMP Report (2005): Least concern; Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule : V (Vermins).

Source : Ellerman (1961), Bates (1988), Corbet and Hill (1992), Agrawal (2000), Alfred *et al.* (2002) and Wilson and Reeder (2005).

Remarks : On the basis of length of hind foot Agrawal (2000) recognized two subspecies *Tatera*

indica indica (Southern limit Maharashtra and Madhya Pradesh) and *T. indica cuvieri* (South India and Sri Lanka). Wilson and Reeder (2005) synonymised all the subspecies under species *Tatera indica.* Same view has been followed here. *Tatera indica* is considered to be an agricultural pest or, rather, 'enemy' pest of highest order, since it causes damage on large scale not only to the stored food grains in the field but also to the standing crops. The species is a prolific breeder. The species is also known to be a natural vector for number of diseases including the dreaded disease like plague.

Subfamily MURINAE

Subfamily Murinae is represented by eight Genera in Karnataka State.

Key to the Genera of Subfamily MURINAE

1. Hallux opposable; hallux and fifth toe having a flat nail ..... ***Vandeleuria***
– Hallux not opposable; hallux and fifth toe possess claws 2
2. Upper incisors grooved on front surface ..... ***Golunda***
– Upper incisors normal and not grooved on front surface 3
3. Condylobasal length exceeds or equals to the occipitonasal length; upper incisors proodont; Size large ..... ***Bandicota***
– Condylobasal length always less than occipitonasal length; upper incisors opisthodont or Orthodont; Size small to medium but never large like bandicoot rats 4
4. First upper molar more than half the length of upper molar row, and its antero-internal cusp distorted inwards to reach the level of second lamina; third molar extremely reduced ..... ***Mus***
– First upper molar less than half the length of the cheek tooth row, and its antero-internal cusp not distorted inwards to reach the second lamina; third molar normal and not extremely reduced 5
5. Palate and anterior palatal foramina long, more than one-half and one fifth of Occipitonasal length respectively ..... ***Millardia***
– Never combining the characters of long palate and palatal foramina 6
6. Palate short, less than one-half of the occipitonasal length and anterior palatal foramina long, more than one-fifth of the occipitonsal length 7
– Palate long more than one-fifth of the occipitonasal length; bullae long, more than 15% of occipitonasal length ..... ***Rattus***
7. Tail bicoloured, wholly dark proximally and white all round distally; Bulla large more than 17% of occipitonasal length ..... ***Madromys***
– Tail unicoloured or faintly bicoloured, dark above and pale below; Bulla small, less than 15% of occipitonasal length ..... ***Cremnomys***

Genus ***Vandeleuria***

Two species of the genus *Vandeleuria* occurs in Karnataka State.

***Key to the species of the genus* Vandeleuria**

– Underpart white in colour ..... *Vandeleuria oleracea*
– Under parts white with grey bases ..... *Vandeleuria nilagirica*

116. ***Vandeleuria nilagirica*** Jerdon

1867. *Mus nilagiricus* Jerdon, *Mamm. India* : 203.

1992. *Vandeleuria nilagirica* : Corbet and Hill, *The Mammals of the Indomalayan region* : 334.

2008. *Vandeleuria nilagirica* : Nameer, P. O. *Zoos' Print,* **XXIII** (8) : 4.

Common Name: Nilgiri Vandeleuria.

Diagnostic Characters : Indian Long-tailed Tree Mouse has been characterized by possession of clawless hallux, 5th finger and toe. A beautiful soft furred field mouse possessing Head and Body

length in the range of 64-105 mm, molars three in number and the tail, as name suggests, long, poorly haired, unicoloured and dark. Tail length in the range of 115%-175% of Head and Body length. It is always longer than Head and Body length. Hind feet smaller and in the range between 15-20.5 mm. Occipitonasal length in the range of 22.4-23.9 mm. Skull with relatively narrow frontals. Upper molar row less than 4 mm. Postero-internal cusp of the first and second upper molar retained throughout the life. Diastema long. Upper incisors narrow, yellow and plain. Fur always soft and smooth. Dorsum in various shades of brown with reddish tinge, while under parts white with grey base. Hind feet whitish or paler. Four pairs of mammary glands present.

Locality : Reported from Coorg, Kutta in Karnataka State (Ellerman, 1961).

Habitat : Terrestrial, arboreal and nocturnal in habit. Trees and shrubs in forest are its natural haunt. Females build globular large nests just a few feet above the ground in the tree hollows, bamboo thickets and thatched roofs of village houses, Baya nests or even in the empty junction boxes fixed on the electric poles. The species is a basically an outdoor species.

Distribution : SW India, E Tamil Nadu, Nilgiri Hills, Ootacamund.

Status : Not very common in the region; Species endemic to India; IUCN Criteria proposed as per the CAMP Report (2005): Not Evaluated, Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule : V (Vermins).

Source : Ellerman (1961), Corbet and Hill (1992), Agrawal (2000), Alfred *et al.* (2002), Wilson and Reeder (2005), and Nameer (2008).

Remarks : Ellerman and Morrison-Scott (1951) and Ellerman (1961) placed *Vandeleuria nilagirica* (Jerdon) as a subspecies of the species *Vandeleuria oleracea*. Later, Agrawal (2000) synonymised under the species *Vandeleuria oleracea*. Corbet and Hill (1992) and Wilson and Reeder (2005) maintained it as a separate species

117. ***Vandeleuria oleracea*** (Bennett)

1832. *Mus oleraceus* Bennett, *Proc. Zool. Soc. Lond.*, 1832 : 121.

2006. *Vandeleuria oleracea* : Alfred, Das and Sanyal, *Animals of India*: *Mammals*. ENVIS- *Zool. Surv. India,* Kolkata : 194.

Common Name : Indomalayan Vandeleuria/ Indian Long tailed tree mouse.

Diagnostic Characters : Same as *Vandeleuria nilagirica.* However, differs in under parts being pure white in *Vandeleuria oleracea*. Slightly smaller than *nilagirica* with Head and Body length in the range of 60-95 mm. Tail length in the range of 117%-178% of Head and Body. It is always longer than Head and Body length. Hind feet smaller and in the range between 14-20 mm. Occipitonasal length in the range of 19.2-23.5 mm. Skull with relatively narrow frontals. Upper molar row less than 4 mm. Postero-internal cusp of the first and second upper molar retained throughout the life. Diastema long. Upper incisors narrow, yellow and plain. Fur always soft and smooth. Hind feet whitish or paler. Four pairs of mammary glands present.

Locality : Reported from Dharwar, Mysore in Karnataka State (Ellerman, 1961; Agrawal, 2000).

Habitat : Terrestrial, arboreal and nocturnal in habit. Trees and shrubs in forest are its natural haunt. Females build globular large nests just a few feet above the ground in the tree hollows, bamboo thickets and thatched roofs of village houses, Baya nests or even in the empty junction boxes fixed on the electric poles. The species is a basically an outdoor species.

Distribution : Rest of the India above southern limits of Mysore, Nepal, Sri Lanka, Myanmar, Pakistan and South-East Asia.

Status : Not very common in the region; IUCN Criteria proposed as per the CAMP Report (2005): Least concern; Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule : V (Vermins).

Source : Ellerman (1961), Corbet and Hill

(1992), Agrawal (2000) and Alfred *et. al.* (2002) and Wilson and Reeder (2005).

Genus ***Millardia***

Only one species and subspecies of the Genus *Millardia* occurs in Karnataka State.

118. ***Millardia meltada meltada*** (Gray)

1837. *Golunda meltada* Gray, *Mag. Nat. Hist.,* **1** : 586.

2000. *Millardia meltada meltada* : Agrawal, V.C., *Rec. zool. Surv. India, Occ. Paper. No.* **180** : 110-112.

Common Name: Soft-furred Metad.

Diagnostic Characters : Indian soft furred-metad has been characterized by possession of tail shorter than Head and Body length, ears rounded and shorter than hind feet length. Five planter pads on each foot. A rather small and a beautiful soft furred field mouse possessing Head and Body length in the range of 97-156 mm, molars three in number and the tail poorly haired but clearly bicoloured. Tail length in the range of 92-145 mm. Hind feet in the range between 21-29 mm. Occipitonasal length in the range of 30.5-36.3 mm. Skull with well-developed supraorbital ridges and long palate, more than one-half of occipitonasal length. Anterior palatal foramina quite long (more than one-fifth of or more than 22% of the occipitonasal length). Nasals long and tend to be narrower behind. Upper molar row always more than 4 mm and less than 6.5 mm (5.0-6.2 mm). Dorsum in various shades of brown with reddish tinge, while under parts perfectly white in colour. Hind feet whitish or paler. Four pairs of mammary glands present.

Locality : Reported from Dharwar, Coorg, Bangalore in Karnataka state (Ellerman, 1961; Agrawal, 2000).

Habitat : Terrestrial, fossorial and nocturnal in habit preferring to live near cultivations. However they may also be found in the heavy shrubs surrounded by forest, or living among rocks and in the tumbled down walls of the deserted houses. They live in pairs or in small colonies. The species is essentially an outdoor species.

Distribution : Andhra Pradesh, Kerala, Madhya Pradesh, Maharashtra, Orissa, Tamil Nadu in peninsular India and Sri Lanka (Rana, 1985, Agrawal, 2000).

Status : Not uncommon in the region; IUCN Criteria proposed as per the CAMP Report (2005): Least concern; Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule : V (Vermins).

Source : Ellerman (1961), Corbet and Hill (1992), Wilson and Reeder (1993), Agrawal (2000) and Alfred *et al.* (2002).

Remarks : Earlier Ellerman (1961) considered *Millardia* as a subgenus of *Rattus.* However latter revisionary taxonomic studies confirmed its generic status. Corbet and Hill (1992) and Alfred *et al.* (2002) accepted same view. The species is a prolific breeder and considered to be an agricultural pest species since it causes damage to the standing crops.

Genus ***Madromys***

Only one species of the Genus *Madromys* occurs in Karnataka State.

119. ***Madromys blanfordi*** (Thomas)

1881. *Mus blanfordi* Thomas, *Ann.Mag. nat. Hist.,* (5), **7** : 24.

2008. *Madromys blanfordi*: Nameer, P.O. *Zoos' Print,* **XXIII** (8) : 4.

Common Name: Blanford's Madromys; Blanford's Rat.

Diagnostic Characters : Blanford's rat has been characterized by the possession of bicoloured tail (wholly dark proximally and wholly white distally) longer than Head and Body length. A comparatively large sized species with Head and Body length in the range of 150-195 mm. Tail length in the range of 185-208mm. Hind feet large and in the range between 32-37 mm. Fur always soft and smooth. Dorsum in various shades of brown with reddish tinge, while under parts white in colour. Hind feet whitish or paler. Occipitonasal length in the range of 40.7-43.9 mm. Skull with well-developed supraorbital ridges and long palate, more than one-half of occipitonasal length.

Anterior palatal foramina quite long (more than one-fifth of or more than 22% of the occipitonasal length). Nasals long and tend to be narrower behind. Upper molar row in the range 6-7mm. Postero-internal cusps of the first and second upper molar retained through out the life. Diastema long. Three pairs of mammary glands present.

Locality : Reported from Sirsi, North Kanara; Sivasamudram, Mysore (Ellerman, 1961; Agrawal, 2000).

Habitat : Terrestrial, fossorial and nocturnal in habit preferring to live in all types of forests including dry deciduous forest, jungle etc. They live among rocks and boulders and even in the burrows made in soft soils. They live in pairs or in small colonies. The species is essentially an outdoor species.

Distribution : Throughout peninsular India and Sri Lanka (Agrawal, 2000).

Status : Not uncommon in the region; IUCN Criteria proposed as per the CAMP Report (2005): Least Concern (For *Cremnomys blanfordi*), Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule : V (Vermins).

Source : Ellerman (1961), Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Agrawal (2000) and Alfred *et al.* (2002).

Remarks : *Madromys blanfordi* was originally placed under genus *Mus,* subsequently in *Rattus, Cremnomys* and finally in the genus *Madromys* (Corbet and Hill, 1992, Agrawal, 2000; Wilson and Reeder, 2005). These rats can also live in open scrub jungles and/or on bare hillsides. In forest it can change its habit from fossorial to arboreal. It makes untidy and large nests in a hole, crevices or in trees.

Genus ***Cremnomys***

Only one species of the Genus *Cremnomys* occurs in Karnataka State.

120. ***Cremnomys cutchicus*** Wroughton

1912. *Cremnomys cutchicus* Wroughton, *J. Bombay nat. Hist. Soc.*, **21** : 340.

2006. *Cremnomys cutchicus*: Alfred, Das and Sanyal, *Animals of India*: *Mammals*. ENVIS-*Zool. Surv. India,* Kolkata : 205.

Common Name: Cutch Cremnomys, Cutch Rock Rat.

Diagnostic Characters : A medium sized soft-furred rat possessing wholly either dark or faintly bicoloured (dark above, paler below) tail longer than Head and Body length. Head and Body length in the range of 104-149 mm. Tail length in the range of 117-174 mm. Hind foot length averages about 26mm. Fifth toe of hind foot longer than hallux. Six planter pads present. Dorsum drab grey to brown and white to white mixed with grey below. Occipitonasal length in the range of 31-36 mm. Skull with short palate, less than half of occipitonasal length, extending posteriorly up to back of third upper molars. Anterior palatal foramina long more than 22% of the occipitonasal length and extending posteriorly between maxillary toothrows. Bulla 14-15% of occipitonasal length. Upper molar row in the range 5.0-6.1 mm. Upper incisors opisthodont, yellow and plain. Three pairs of mammary glands present.

Locality : Reported from Bellary, Kolar and , Mysore districts (Ellerman, 1961; Agrawal, 2000).

Habitat : Prefers rocky habitat, with sparse vegetation. Feeds mainly on plant material and also takes insects.

Distribution : Endemic to India; Peninsular India extending north up to Rajasthan and Bihar (Agrawal, 2000).

Status : Species endemic to India; IUCN Criteria proposed as per the CAMP Report (2005): Least Concern; Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule : V (Vermins).

Source : Ellerman (1961), Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Agrawal (2000) and Alfred *et al.* (2002).

Genus ***Rattus***

Three species of the genus *Rattus* occur in Karnataka State.

Key to the species of the genus *Rattus*

1. Large size (200-250 mm), occipitonasal on an average between 35-55 mm. in length, tail short about 80-90% of head and body length, tail obscurely bicoloured .... *Rattus norvegicus*

– Medium size (140-200 mm.), occipitonasal on an average between 37-47 mm in length, tail unicoloured and long more than 120% of head and body length 2

2. Tail length more than 150% of the Head and Body length ..... *Rattus satarae*

– Tail length less than 150% of the Head and Body length ..... *Rattus rattus*

Species ***Rattus rattus***

Common roof/house rat, *Rattus rattus,* is represented in Karnataka State by two subspecies.

Key to the Subspecies of *Rattus rattus*

– Ventral surface purely white; Out-door subspecies Mostly arboreal in behavior .... *Rattus rattus wroughtoni*

– Ventral surface in different shades of grey but never white; In-door commensal subspecies; May live on roofs of houses but never on treetops ..... *Rattus rattus rufescens*

*121. ***Rattus rattus rufescens*** (Gray)

1837. *Mus. rufescens* Gray. *Ann. Mag. nat. Hist,* **1** : 35.

1992. *Rattus rattus rufescens* : Corbet and Hill, *The Mammals of the Indomalayan region*: 339-340.

Common Name : House Rat, Roof Rat.

Diagnostic Characters : A medium sized house rat with long tail, dorsum rufous brown and venter slaty grey or in various shades of grey but never white in colour, tail uniformly dark in colour. The subspecies is characterized by possession of clawed hallux and long tail (more than 120% of the Head and Body length). Head and Body length in the range between 140-200 mm. *Rattus* species also possess elongated anterior palatal foramina (more than 7.0 mm in length) & extending between maxillary tooth row. Upper molar tooth row normal and more than 5.0 mm (5.5-6.6mm), palate long and more than one-half of the occipitonasal. Molars three in number. Hind feet moderate and in the range between 26-36 mm. Occipitonasal length in the range of 36-46.5 mm. Upper incisors narrow, yellow and plain. Dorsum dark and rufous brown, while under parts dull in colour. Fur with some broad and flat spines in the dorsal pelage. Hind feet usually dark in colour. Five pairs of mammary glands present.

Locality : The subspecies is known to occur in all the regions of Karnataka State.

Habitat : Terrestrial, and a most common commensal form, found in houses, godowns, shops, residential complexes, also in scrubby and secondary forests.

Distribution : Throughout India.

Status : Many populations have been sighted from number of localities, IUCN Category proposed as per CAMP Report (2005): Least concern (For *Rattus rattus*), Indian Wildlife (Protection) Act (1972) (As amended upto2006) Schedule : Schedule V (Vermin).

Source : Ellerman (1961), Agrawal (2000), Corbet and Hill (1992) and Wilson and Reeder (1993, 2005).

Remarks : A pest species causing extensive damages to the household as well as public properties. The species is also a carrier of vectors for number of diseases. Taxonomically Tiwari *et al.* (1971), proposed to allot this population a specific status on the basis of morphological studies.

*122. ***Rattus rattus wroughtoni*** Hinton

1919. *Rattus rattus wroughtoni* Hinton, *J. Bombay N.H. Soc.,* **26** : 384.

1992. *Rattus rattus wroughtoni* : Corbet and Hill, *The Mammals of the Indomalayan region*: 337.

Common Name: White-bellied House Rat.

Diagnostic Characters : White-bellied House Rat with Head and Body length in the range between 144-210 mm. Tail is always longer than Head and Body length (below 130% of the Head

and Body length). Hind feet moderate and in the range between 30-33 mm. Occipitonasal length in the range of 36.9-41.3 mm. Upper incisors narrow, yellow and plain. Upper molar tooth row normal and more than 5.5 mm (5.6-6.6 mm), Dorsum dark and rufous brown, while under part white in colour sometimes mixed with sulphur yellow colour. Tail unicoloured and dark. Five pairs of mammary glands present.

Locality : Two specimens collected from Bandipur Tiger Reserve and Nagarhole National Park, Karnataka State by ZSI, WRC survey parties during surveys (M/481 and M/507).

Habitat : Mostly arboreal. Very rarely comes on the ground. Generally seen in coconut and other plantations. Terrestrial and nocturnal in habit..

Distribution :Coastal areas of Western Ghats in India.

Status : Subspecies endemic to India; IUCN Criteria proposed as per the CAMP Report (2005): Least concern (For *Rattus rattus*), Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule : V (Vermins).

Source : Ellerman (1961), Raman and Sharma (1977), Corbet and Hill (1992), Wilson and Reeder (1993, 2005) and Molur *et al.* (2005).

Remarks : The subspecies is a prolific breeder. Musser and Carleton in Wilson and Reeder (1993) opine that the subspecies should be attributed to *Rattus tanezumi* (Temminck) based on chromosomal and certain biochemical parameters. However, it has been observed that even these parameters are unstable. The chromosomal number is also variable in *Rattus rattus* subspecies (Raman and Sharma, 1977). Hence, *status quo* has been proposed by Wilson and Reeder (2005) and Corbet and Hill (1992). Similar view has been accepted here. A pest species of higher order causing extensive damages to the coconut plantations in the Western Ghats.

123. ***Rattus satarae*** Hinton

1918. *Rattus rattus satarae* Hinton, *J. Bombay nat. Hist. Soc.*, **26** (1) : 87.

2005. *Rattus satarae* : Musser, G. G. & Carleton, M. D. In : Wilson and Reeder, *Mammal Species of the World.*

Common Name : Sahyadri Forest Rat.

Diagnostic Characters : White-bellied forest Rat with Head and Body length in the range between 116-200 mm. Tail unicoloured, dark and always longer than Head and Body length (exceeding 150% of the Head and Body length). Dorsum golden brown with black hairs intermixed, while under parts white in colour, fur moderately thick. Hind feet usually dark in the range between 31-35 mm. 5 pairs of mammae present. Occipitonasal length in the range of 42.4-43 mm. Upper incisors narrow, yellow and plain. Upper molar tooth row normal and more than 6.5 mm (6.5-6.9mm). Five pairs of mammary glands present.

Locality : Western Ghats in Karnataka State.

Habitat : Tropical evergreen rain forest. Altitudinal range, 1500-2150m.

Distribution : Northern part of Western Ghats at and near the type.

Locality (Satara in Maharashtra State) and Nilgiri Hills (Tamil Nadu State) in the south, which approximates the extent of tropical evergreen rain forest along the SW mountainous margin of SW peninsular India (Musser and Carleton in Wilson and Reeder, 2005).

Status : Species endemic to India; IUCN Criteria proposed as per the CAMP Report (2005): Not Evaluated, Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule : V (Vermins).

Source : Ellerman (1961), Corbet and Hill (1992), Wilson and Reeder (1993, 2005).

Remarks : Musser and Carleton in Wilson and Reeder (2005) commented that the distribution of the species is presently reduced to small, isolated patches through conversion of forest land to agriculture land and plantations; The forest islands between Satara region (Maharashtra) and Nilgiri Hills (Tamil Nadu) probably contain *R. satarae.*

124. ***Rattus norvegicus*** (Berkenhout)

1769. *Mus. norvegicus* Berkenhout, *Outlines N.H. Gt. Britain and Ireland*, **1** : 5.

2000. *Rattus norvegicus*: Agrawal, V.C., *Rec. zool. Surv. India, Occ. Paper. No.* **180** : 81.

Common Name : Norvey Rat, Drain Rat, Brown Rat.

Diagnostic Characters : Brown rat is a larger and more robust-looking rat than the black rat or common house rat. It can be recognized by shorter tail, shorter than head and body length, dorsum brown or light brown, while venter slatey grey in colour, tail obscurely bicoloured. Skull large, occipitonasal length 45-55 mm; Supraorbital ridges powerful, extending backwards fairly straight up to occiput. Palate long, more than one-half of occipitonasal length, extending posteriorly far behind third upper molars. Basically *R. norvegicus* is an introduced species through transportation by human agencies and has initially established itself in the sea port cities of Asia.

Locality : Costal areas of Karnataka State.

Habitat : Terrestrial and fossorial, an introduced species from temperate lands, has now established itself in number of sea-port cities of Asia. In India it is a commensal rodent species competing with common house rat (*R. r. rufescens*) and field rat (*B.bengalensis*) particularly in metropolis. In metropolitan cities like Mumbai, Kolkata and Chennai this rat has been collected from drains and sewers (Hence the name Drain Rat).

Distribution : Port cities and towns interior accessible by navigations in India.

Status : Many populations have been reported from number of navigable localities, IUCN Criteria proposed as per CAMP Report (2005) : Not Evaluated; Indian Wildlife (Protection) Act (1972) (as amended upto 2006) Schedule : Schedule V (Vermin).

Source : Ellerman (1961), Prater (1980), Pradhan (1976), Corbet and Hill (1992) and Wilson and Reeder (1993, 2005).

Remarks : A pest species of higher order causing extensive damage to the household as well as public properties. The species is also a carrier of vectors for number of diseases.

Genus ***Golunda***

Genus *Golunda* is reported to be represented by a single species in Karnataka State.

125. ***Golunda ellioti*** Gray

1837. *Golunda ellioti* Gray, *Charlesworth's Mag. nat. Hist.*, **1** : 586.

2006. *Golunda ellioti* : Alfred, Das and Sanyal, *Animals of India*: *Mammals*. ENVIS- *Zool. Surv. India,* Kolkata : 200.

Common Name : Indian Bush Rat.

Diagnostic Characters : Medium sized rat (Head and Body length 102-170 mm) with rather hairy tail, upper incisors grooved in front, heavily cuspidated upper molar teeth, tall and discrete cusps retain its original shape even after considerable wear and tear; dorsal coat is yellowish brown, while the ventral side is lighter in colour. Genus *Golunda* is characterized by possession of highly unusual dentition, bicoloured tail shorter than Head and Body length and outer digit of hind foot and 5th finger shortened. Molars three in number. Tail length in the range of 86-131 mm. Hind feet medium and in the range between 21-28 mm. Occipitonasal length in the range of 28-35.4 mm. Skull with well-developed supraorbital ridges and long palate, more than one-half of occipitonasal length. Anterior palatal foramina long but less than one-fifth of or less than 22% of the occipitonasal length. Molars heavily cuspidate. Upper molar row always more than 4 mm but less than 7.0 mm (5.8-6.8 mm). Cusps of upper molars abnormally enlarged (grape shaped), particularly in the middle and inner rows; third upper molar large, lacks the outer row of the cusps and with wear tends to look like the largest tooth in the row. Lower molars (Maxillary teeth) biserially cuspidate. Antero-internal cusps in M^1 not distorted inwards. Fur always thick, long and soft, sometimes with growing age tends to become spiny. Dorsum varying in the range between

grayish brown to blackish, while under parts in the range between white to bluish grey in colour. Hind feet whitish or paler. Four pairs of mammae present.

Locality : Reported from Dharwar; Kardibetta Forest, Mysore; Wotekolli, Coorg in Karnataka State (Ellerman, 1961; Agrawal, 2000);

Habitat : Terrestrial. It is essentially a rat of jungle and forest, but may venture in adjoining cultivated fields, a favourable habitat for this rat is bush and scrub jungle, many prefer to live in woven nests built in bushes. It builds a densely woven nest of stalks, grass and fibres in bushes. It's a small moving creature. They live in pairs or in small colonies. The species is essentially an outdoor species.

Distribution : Throughout India.

Status : Many populations have been recorded from number of localities, IUCN Criteria proposed as per CAMP Report (2005) : Least concern; Indian Wildlife (Protection) Act (1972)(as amended upto 2006) Schedule : Schedule V.

Source : Corbet and Hill (1992),Wilson and Reeder (1993, 2005) and Agrawal (2000).

Remarks : The species is a prolific breeder and considered to be an agricultural pest species since it causes damage to the plantations. Earlier it was causing extensive damage to the coffee plantation in Sri Lanka.

Genus ***Mus***

Genus *Mus* is represented in Karnataka State by six species.

Key to the species of the Genus *Mus*

1. Tail unicoloured, and longer than head and body length; diastema, in skull, equal or less than one-fourth of occipitonasal length ..... *Mus musculus*

– Tail bicoloured, dark above and paler below, equal to or shorter than head and body length; Diastema, in skull, generally more than one-fourth of occipitonasal length 2

2. Fur generally spiny; supraorbital ridges, in skull, well–developed 3

– Fur soft; supraorbital ridges either absent or scarcely developed 5

3. Smaller form, occipitonasal length 20-23 mm; maxillary toothrows less than 4 mm in length ..... *Mus phillipsi*

– Larger form, occipitonasal length 23-30 mm; maxillary toothrows more than 4 mm in length 4

4. An anterior accessory cusp present on first lamina of first upper molar; chromosome number 2n = 22 or 26 ..... *Mus saxicola*

– No anterior accessory cusp present on first lamina of first upper molar; chromosome number 2n = 30 ..... *Mus platythrix*

5. Smaller mice, hind feet 14-16 mm; occipitonasal length less than 20 mm ..... *Mus booduga*

– Larger mice, hind feet 16-21mm; occipitonasal length greater than 20 mm ..... *Mus cookii*

Species ***Mus musculus***

Common house mouse, *Mus musculus,* is represented in Karnataka State by only one subspecies.

*126. ***Mus musculus castaneus*** Waterhouse

1843. *Mus castaneus* Waterhouse, *Ann. Mag. nat. Hist.,* **12** : 134.

2000. *Mus musculus castaneus* : Agrawal, V.C., *Rec. zool. Surv. India, Occ. Paper. No.,* **180** : 120-122.

Common Name: House Mouse.

Diagnostic Characters : A small house mouse with Head and Body length in the range of 55-80 mm, molars three in number and tail always long and short haired (Range 68-88 mm). It may be mostly longer than Head and Body. Infraorbital foramen large and open for muscle transmission. Upper molar row less than 4 mm but highly specialized. First upper molar over half the length of the entire molar tooth-row, while third molar extremely reduced. Anterointernal cusp of the first

molar heavily distorted on the inner side. Palatal foramina long extending posteriorly between the toothrow and more than 20% of the occipitonasal length. Dorsum generally dark brown, while venter always dark grey or ochraceous brown, but never white, and hind foot brown in colour. Tail uniform in colour. Five pairs of mammary glands present.

Locality : Reported from Gersoppa, Kanara; Sagar, Mysore; found throughout the state (Ellerman, 1961; Agrawal, 2000); Sighted in Dharwad, Bangalore, Mysore during NBR surveys.

Habitat : Terrestrial, fossorial and found in all habitats since it is a commensal species. A common house mouse causing extensive damage to the properties. The species is considered to be the indoor species and rarely seen outdoor.

Distribution : Throughout India.

Status : Common in residential premises; IUCN Criteria proposed as per the CAMP Report (2005) : Least concern (For *Mus musculus*), Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule : V (Vermins).

Source : Marshall (1977), Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Alfred *et al.* (2002) and Agrawal (2000).

Remarks : The species is a prolific breeder and considered to be a pest species of higher order since it causes damage to the food grains stored in godowns. It is also responsible to cause extensive damage to the public as well as private properties and articles of merchandise due to its habit of gnawing by its ever-growing chisel-shaped incisors.

Species ***Mus booduga***

Mus booduga, is represented in Karnataka State by only nominate subspecies.

*127. ***Mus booduga booduga*** (Gray)

1837. *Leggada booduga* Gray, *Charlesworth's Mag. Nat. Hist.,* **1** : 586.

1961. *Mus booduga booduga* : Ellerman, J.R., *Fauna of India including Pakistan, Burma and Ceylon, Mammalia,* vol. **III** (Part II) : 744-753.

Common Name: Little Indian Field Mouse.

Diagnostic Characters : *Mus b. booduga* is a commonly seen small field mouse possessing Head and Body length in the range of 50-88 mm, molars three in number and tail short haired and bicoloured (Pale below). Tail length in the range of 50-72 mm. It may or may not be equal to Head and Body length. Hind foot smaller and in the range between 13-17 mm. Upper molar row less than 4 mm but highly specialized. First upper molar bears anterior accessory cusp extending over half the length of molar tooth-row, while third molar extremely reduced. Anterointernal cusp of the first molar heavily distorted on the inner side. Anterior palatal foramina long extending posteriorly between the toothrow and more than 20% of the occipitonasal length. Upper incisors opisthodont. Fur smooth. Dorsum varies from light to dark reddish or rusty brown and under parts perfectly white, whitish, grey or, sometimes even dull grey in colour. But apparently both, white and grey bellied forms, occur together in many localities and it is very difficult to divide this species into subspecies on the basis of the colour of the under parts (Agrawal, 2000). Hind foot whitish or paler. Five pairs of mammary glands present.

Locality : Reported from Gadak, Bellary, Dharwar, Shimoga, Bangalore, Mysore, Coorg in Karnataka State (Ellerman, 1961; Agrawal, 2000), Sighted in crop fields in Dharwad, Belgaum districts during NBR surveys.

Habitat : Terrestrial, fossorial and nocturnal in habit and generally found in agricultural crop field areas. Inhabits burrows in the field or on the edges of the cultivations. The species is basically an outdoor species.

Distribution : Throughout India.

Status : common in the fields; IUCN Criteria proposed as per the CAMP Report (2005): Least concern; Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule : V (Vermins); Ellerman (1961), Marshall (1977), Corbet and Hill (1992), Wilson and Reeder (1993, 2005) and Agrawal (2000).

Remarks : Marshall (1977), Corbet and Hill (1992) and Agrawal *et al.* (1992) separated *Mus booduga, Mus terricolor* and *Mus dunni* on the basis of variations in the under parts colour and also in the chromosomal studies conducted by Sen & Sharma (1983). However recently Agrawal (2000) has pointed out number of anomalies in the taxonomy of *booduga* complex. He rightly concluded that till the confusions were removed, *Mus dunni, Mus terricolor* and *Mus booduga* should be treated as synonyms of *Mus booduga* as was done earlier by Ellerman (1961) due to lack of proper demarcation between the populations under study. The species is a prolific breeder and considered to be a pest species since it causes damage to the crops. It is also responsible to cause extensive damage to the public as well as private properties due to its habit of gnawing by its ever-growing chisel-shaped incisors.

128. ***Mus phillipsi*** Wroughton

1912. *Mus phillipsi* Wroughton, *J. Bombay nat. Hist. Soc.*, **21** : 772.

2000. *Mus phillipsi* : Agrawal, V.C., *Rec. zool. Surv. India, Occ. Paper. No.* **180** : 127-129.

Common Name: Wroughton's Small Spiny Mouse.

Diagnostic Characters : A small spiny furred field mouse with Head and Body length in the range of 62.0 - 80.0 mm. Tail bicoloured, dark above and pale below. Tail shorter than Head and Body length, about 80% of Head and Body length. Hind feet, in the range between 14.0 - 18.0 mm and white in colour. Dorsal colour brown to buff and white below. Mammae 5 pairs. Occipitonasal length in the range of 21.2-23.2 mm. Skull with well developed supraorbital ridges. Anterior palatal foramina extending posteriorly between maxillary toothrow. Upper incisors opisthodont, Maxillary toothrow less than 4 mm, averages 3 mm in length. First upper molar without an anterior accessory cusp; Anterointernal cusp (t1) distorted inwards to be in line with second.

Locality : Reported from Bellary, Vijaynagar in Karnataka State (Ellerman, 1961; Agrawal, 2000).

Habitat : Terrestrial, fossorial and nocturnal in habit and generally found in rocky habitat.

Distribution : Rajasthan, Gujarat, Madhya Pradesh, Maharashtra, Andhra Pradesh and Tamil Nadu in India and also reported from Nepal (Agrawal, 2000).

Status : IUCN Criteria proposed as per the CAMP Report (2005): Least concern; Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule : V (Vermins); Ellerman (1961), Marshall (1977), Corbet and Hill (1992), Wilson and Reeder (1993, 2005) and Agrawal (2000).

Remarks : Ellerman and Morrison-Scott (1951) and Ellerman (1961) treated this taxa as a subspecies of *Mus cervicolor.* However, Marshall (1977) restored it to the specific level on the basis of spiny fur, white venter and well developed supraorbital ridges on the skull.

Species ***Mus cookii***

Mus cookii, is represented in Karnataka State by only one subspecies.

129. ***Mus cookii nagarum*** (Thomas)

1921. *Leggada nagarum* Thomas, *J. Bombay nat. Hist. Soc.*, **27** : 597.

2000. *Mus cookii nagarum* : Agrawal, V.C., *Rec. Zool. Surv. India, Occ. Paper. No.* **180** : 131.

Common Name: Ryley's Spiny Mouse.

Diagnostic Characters : Medium sized short-furred spiny mouse, dorsum dark brown with grey undersurface. Head and Body length in the range of 64-86 mm. Tail bicoloured, dark above and pale below and longer than Head and Body length. Hind feet whitish. Occipitonasal length of the skull less than 23.0 mm. Diastema more than one-fourth of occipitonasal length. Anterior palatal foramina long, more than one-fifth but less than 23% of occipitonasal length. Upper incisors opisthodont or orthodont. Maxillary toothrow about 3.5 mm.

Locality : Reported from Coorg, Mysore in Karnataka State (Agrawal, 2000).

Habitat : Inhabits grassy areas in conifer and

broad leaf forests, in mountain region; also found near cultivated fields (Corbet and Hill, 1992, Agrawal, 2000).

Distribution : Arunachal Pradesh, Assam, Meghalaya, Manipur, Nagaland West Bengal, Maharashtra (Reported by Marshall,1977. However species occurrence in this region needs confirmation), Kerala and Tamil Nadu in India (Agrawal, 2000).

Status : Subspecies endemic to India; IUCN Criteria proposed as per the CAMP Report (2005): Least concern (For *Mus cookii*), Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule : V (Vermins); Ellerman (1961), Marshall (1977), Corbet and Hill (1992), Wilson and Reeder (1993, 2005) and Agrawal (2000).

Remarks : Ellerman-Morrison-Scott (1951), Ellerman (1961) listed *Leggada nagarum* Thomas and *Leggada palnica* Thomas, as subspecies of *Mus cervicolor* Hodgson. They treated *Mus cookii* Ryley, 1914 as the subspecies of *Mus famulus* Bonhote, 1898. Later, Marshall (1977) shifted them under *Mus cookii* Ryley. However, due to overlapping of key characters Agrawal (2000) recognized only two subspecies namely *Mus cookii cookii* and *Mus cookii nagarum*.

130. ***Mus platythrix*** Bennett

1832. *Mus platythrix* Bennett, *Proc. Zool. Soc. Lond.*, : 121.

2000. *Mus platythrix* : Agrawal, V.C., *Rec. zool. Surv. India, Occ. Paper. No.* **180** : 132-133.

Common Name: Brown Spiny Mouse.

Diagnostic Characters : Medium-sized mouse with Head and Body length averages 95mm in the range of 77-123 mm. Tail bicoloured, dark above and pale below , shorter, about 80% of the Head and Body length. Dorsal body colour dusky to dark brown and white to grayish white venter; Hind feet with or without slaty spot or dark stripe on it. Fur spiny. Mammae 5 pairs. Occipitonasal length of the skull in the range of 23.5-27.6 mm. Supraorbital ridges prominent; Anterior palatal foramina short less than 21% of occipitonasal length, extending posteriorly upto anterior root of first upper molar. Palate more than one-half of occipitonasal length. Interpterygoid space wider than in *Mus saxicola*. Upper incisors opisthodont or orthodont with or without a notch, Maxillary toothrow more than 4 mm, in the range between 4.0-4.7 mm; First upper molar without an anterior accessory cusp.

Locality : Reported from Karwar and Coorg in Karnataka State (Agrawal, 2000).

Habitat : Found mainly in uncultivated hilly country (Corbet and Hill, 1992).

Distribution : Rajasthan, Madhya Pradesh, Maharashtra, West Bengal, Andhra Pradesh, Tamil Nadu in India (Agrawal, 2000).

Status : IUCN Criteria proposed as per the CAMP Report (2005): Least concern; Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule : V (Vermins).

Source : Ellerman (1961), Marshall (1977), Corbet and Hill (1992), Wilson and Reeder (1993, 2005) and Agrawal (2000).

Remarks : The species is a prolific breeder and considered to be a pest species since it causes damage to the crops. It is also responsible to cause extensive damage to the public as well as private properties due to its habit of gnawing by its ever-growing chisel-shaped incisors.

Species ***Mus saxicola***

Mus saxicola, is represented in Karnataka State by only nominate subspecies.

131. ***Mus saxicola saxicola*** Elliot

1839. *Mus saxicola* Elliot, *Madras J. Litt. Sci.* **10** : 215.

2002. *Mus saxicola saxicola* : Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.* **199** : 212.

Common Name: Elliot's Spiny Mouse.

Diagnostic Characters : Dorsum pale brown to golden brown; Fur spiny; Head and Body length ranges between 71-112mm. Tail bicoloured, dark above and pale below and shorter than Head and Body length. Hind foot white, its length ranges between 16-19 mm. Mammae six pairs, sometimes

five pairs (Agrawal, 2000). Occipitonasal length of the skull in the range of 22.6-28.0mm. Supraorbital ridges prominent. Anterior palatal foramina long, more than 22% of Occipitonasal length, extending posteriorly upto second lamina of first upper molar. Palate more than one-half of occipitonasal length. Interpterygoid space narrower than in *Mus platythrix*. Upper incisors opisthodont or orthodont and without a notch, Maxillary toothrow more than 4 mm, in the range between 4.0-4.85 mm; An accessory cusp present on the anterior root of first upper molar.

Locality : Reported from Dharwar and Mysore in Karnataka State (Agrawal, 2000);

Habitat : Lives in sandy, rocky or gravelly habitat (Agrawal, 2000).

Distribution : Maharashtra, Andhra Pradesh, Tamil Nadu in India (Agrawal, 2000).

Status : IUCN Criteria proposed as per the CAMP Report (2005): Least concern; Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule : V (Vermins).

Source : Ellerman (1961), Marshall (1977), Corbet and Hill (1992), Wilson and Reeder (1993, 2005), Alfred *et. al.* (2002) and Agrawal (2000).

Remarks : None.

Genus ***Bandicota***

Genus *Bandicota* is recognized by its condylobasal length exceeding or equals to occipitonasal length, upper incisors proodont and tail short and scaly. Genus *Bandicota* is represented by three species in Karnataka State.

Key to the species of Genus *Bandicota*

1. Occipitonasal length, in Indian species, less than 45 mm; zygomatic width more than 57% and bullae more than 20% of occipitonasal length, nasals less than one third of occipitonasal length ..... *Bandicota bengalensis*

– Occipitonasal length clearly more than 45 mm; zygomatic width less than 57%, bullae leas than 20% and nasals more than one third of occipito-nasals length 2

2. Occipitonasal length always less than condylobasal length; occiput region flat and ridges prominent; sculpture pattern of dorsal guard hairs at base mosaic at lower magnification ..... *Bandicota indica*

– Occipitonasal length equal to or more than condylobasal length; occiput region inflated and ridges less prominent; sculpture pattern of dorsal guard hairs at base chevron at lower magnification ..... *Bandicota maxima*

*132. ***Bandicota bengalensis*** (Gray)

1833. *Arvicola bengalensis* Gray and Hardwicke, *Illustr. Indian Zool.*, **2** : pl. 21.

2006. *Bandicota bengalensis* : Alfred, Das and Sanyal, *Animals of India*: *Mammals*. ENVIS-*Zool. Surv. India,* Kolkata : 199.

Common Name : Lesser Bandicoot Rat.

Diagnostic Characters : The bandicoots are mole rats superficially look like the European brown rat, *Rattus norvegicus*, in external appearance. It is a medium sized robustly built rat with a semi-naked scaly tail which is slightly shorter than head and body. The body fur is rather coarse and harsh. The head is typically triangular with rounded ears, short and broad muzzle. These rats have a habit of erecting its pile of long hairs and grunting when excited. Head and Body length in the range between 140-220 mm. Tail (99.0-202.0 mm) always shorter than Head and Body. Occipitonasal length which is clearly less than condylobasal length never exceeds 48 mm; zygomatic width is always more than 57% of the occipitonasal length. Occipitonasal length in the range between 34-48 mm. Nasals short and less than one third of the occipitonasal length. Palate long and more than 60% of the occipitonasal length. Upper molar tooth row normal and more than 5.0 mm (5.9-8.0mm). Molars with 9 cusps (t7 present). Hind feet moderate and in the range between 26-36 mm. Upper incisors broad and orange to lemon yellow in colour. Dorsum grayish brown to blackish occasionally with reddish tinge, while under parts light to dark grey in colour. Fur with some broad and flat spines mixed with some short and harsh hairs in the dorsal pelage. Tail

unicoloured and dark. 6 to 9 pairs of mammary glands present (Total number variable).

Locality : Reported from Bellary, Dharwar, Kanara, Mysore, Bangalore, Coorg in Karnataka State (Agrawal, 2000). Sighting recorded in the crop fields in Dharwad district during NBR surveys by ZSI team

Habitat : Terrestrial, fossorial and nocturnal rodent species found throughout India. The species is basically a field rat and generally lives in cultivated plains, gardens, pasture land, crop fields , waste lands, forests. However, sometimes in cities like Mumbai, Kolkata and Chennai, it enters houses also. Its presence is always made known by a pile of fresh soil resembling mole hill, hence it name 'Mole Rat' It has a habit of erecting pile of hairs and grunting when excited. It makes complex burrows with number of openings covering large areas.

Distribution : Throughout India.

Status : common but pest species; IUCN Criteria proposed as per the CAMP Report (2005): Least concern; Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule : V (Vermins).

Source : Ellerman (1961), Corbet and Hill (1992) and Pradhan *et al.* (1993) and Agrawal (2000).

Remarks : *B. bengalensis* is considered to be an agricultural pest No. 1, since it causes damage on large scale not only to the food grains stored in godowns but also to the standing crops. Its habit of making complex burrow systems for not only living but also for hoarding the food stuff make it a nuisance for the human life. It is responsible to cause extensive damage to the public as well as private properties and articles of merchandise due to these habits. The species is a prolific breeder. The species is also known to be a vector for number of diseases, including rat bite fever, plague, leptospirosis etc.

Species ***Bandicota indica***

Bandicota indica is represented by two subspecies in Karnataka State.

Key to the subspecies of *Bandicota indica*

– Occipitonasal length in adult specimens more than 56 mm, Nasals and diastema exceeds 40% and 33% of occipitonasal length respectively, size medium to large .... *Bandicota indica malabarica*

– Occipitonasal length in adult specimens less than 56 mm, Nasals and diastema less than 40% and 33% of occipitonasal length respectively, size small to medium .... *Bandicota indica indica*

133. ***Bandicota indica malabarica*** (Shaw)

1801. *Mus malabarica* Shaw, *Genl. Zool.*, **2** : 54.

1971. *Bandicota indica malabarica* : Tiwari, Ghosh and Chakraborty, *J. Bombay nat. Hist. Soc.*, **68**(2) : 383-384.

1993. *Bandicota indica malabarica* : Pradhan, M.S., Mondal, A.K., Bhagwat, A.M. and Agrawal, V.C., *Rec. zool. Surv. India*, **93**(1-2) : 175-200.

2003. *Bandicota indica malabarica* : Srinivasulu, C. and Pradhan, M.S., *Zoos' Print Journal*, **18** (12) : 1295.

Common Name : Large bandicoot rat.

Diagnostic Characters : Large sized bandicoot rat with head and body length ranging between 250 mm to 310 mm in adult specimens, hind feet in the range of 53 mm. to 61 mm; Occipitonasal length in the range of 56 to 61 mm; dorsal colour varying in the shades of blackish to slaty grey, fur coarse with bristles on hind quarter; long tail unicoloured and dark. Hind foot dark in colour. 6 pairs of mammae present. Sculpture pattern of dorsal guard hairs at base mosaic at lower magnification.

Locality : Reported from Kolar, Sagar, Bangalore, Devikop, Samasagi, Coorg from Karnataka State in Western Ghats (Ellerman, 1961);

Habitat : Terrestrial, fossorial, known to invade cultivated fields, gardens, forest fringes, swampy areas etc; However, specimens were collected from areas close to human habitations also.

Distribution : Western Ghats;

Status : Subspecies endemic to India; IUCN

Criteria proposed as per the CAMP Report (2005): Least concern (For *Bandicota indica*); Indian Wildlife (Protection) Act (1972 as amended upto 2006) Schedule : Schedule : V(Vermin).

Source : Ellerman (1961), Tiwari *et al.* (1971), Agrawal (1972, 2000) Pradhan (1979, 1982) and Pradhan *et al.* (1993, 2005).

Remarks : Though Agrawal (1972, 2000), Corbet and Hill (1992) and Alfred *et al.* (2002) synonymised *malabarica* population in *B. indica indica*, in light of detailed morphological and biochemical studies carried out by Pradhan (1979, 1982), Pradhan *et al.* (1989, 1993 and 2005) *B. indica malabarica* has been retained here as a separate subspecies. The subspecies is reported to be causing extensive damages to public and private properties. It is also known to be a vector for some diseases.

*134. ***Bandicota indica indica*** (Bechstein)

1800. *Mus indicus* Bechstein, In Pennant, *Allgemeine Ueber Vierfuss. Thiere*, **2** : 497.

2002. *Bandicota indica indica* : Alfred, Sinha and Chakraborty, *Rec. zool. Surv. India, Occ. Paper No.* **199** :199.

Common Name : Larger Bandicoot Rat.

Diagnostic Characters : Medium to large sized robost bandicoot rat with head and body length ranging between 200 mm and 300 mm and hind feet in the range between 45-57 mm. Tail (245-315 mm) may be equal to or more than Head and Body length. Occipitionasal length in the range between 48-56 mm; while zygomatic width in the range between 26-31 mm. Occipitonasal length always less than condylobasal length in the species. It possesses more or less sqarish head, round ear and longish muzzle. Nasals short and less than one third of the occipitonasal length. Palate long but less than 60% of the occipitonasal length. Upper molar tooth row normal and more than 7.0 mm (7.8-11.4 mm). Molars with 9 cusps (t7 present). Upper incisors thick and powerful and usually brown or yellow but rarely white in colour. Dorsum blackish brown to black occasionally intermixed with whitish hairs, while under parts light to dark grey in colour. Some colour variant forms with white patch on thorasic and/or inguinal regions and part of the tail wholly white at the terminal end have been reported from other Indian localities. Fur with some broad, long and flat spines mixed with some short and harsh hairs in the dorsal pelage. Tail unicoloured and dark. Hind foot dark in colour. 6 pairs of mammary glands present. Sculpture pattern of dorsal guard hairs at base mosaic at lower magnification.

Locality : Reported from Ootacamund, Coorg, Masinagudi in Karnataka State (Ellerman, 1961; Pradhan and Kurup, 2001).

Habitat : Terrestrial and fossorial, known to invade cultivated fields, swampy areas and also forest fringes, godowns, open and closed drainage systems in urban areas.

Distribution : Throughout the peninsular India.

Status : Pest species. Many populations have been reported from number of localities; IUCN Criteria proposed as per the CAMP Report (2005): Least concern (For *Bandicota indica*); Indian Wildlife (Protection) Act (1972as amended upto2006) Schedule : Schedule : V (Vermin); IUCN Criteria proposed as per the CAMP Report (2005) : Least Concern.

Source : Ellerman (1961), Agrawal (1972, 2000), Pradhan (1979, 1982), Corbet and Hill (1992) and Pradhan *et al.* (1993), Pradhan and Kurup (2001).

Remarks : The species is considered to be an agricultural pest causing extensive damage to the standing crops, food grain godowns, public, and private properties etc. The species is a prolific breeder and is also known to be a vector for number of diseases. Taxonomic remarks same as previous subspecies

135. ***Bandicota maxima*** Pradhan *et al.*

1993. *Bandicota maxima* Pradhan, M.S., Mondal, A.K., Bhagwat, A. M. and Agrawal, V.C., *Rec. Zool. Sur. India*, **93** (1-2) : 175-200.

2005. *Bandicota maxima* : Pradhan, M.S., Mondal, A.K. and Bhagwat, A.M., *Rec. zool. Surv. India*, **104** (1-2) : 85-90.

Common Name : Large Bandicoot Rat.

Diagnostic Characters : A very large sized bandicoot rat, with triangular head, rounded snout, tail shorter than head and body, body covered with coarse fur, dorsum varies from dark slaty grey to light brown in colour, skull more or less similar to that of *B. indica* except that *B. maxima* possess swollen occiput, occipitonasal length equal to or more than condylobasal length. Hair impression pattern of *Bandicota maxima* exhibits distinct chevron patterns as against irregularly waved mosaic hair sculpture pattern of *B. indica* under lower magnification.

Locality : Reported from adjoining areas of Karnataka State from Maharashtra and Goa (Pradhan *et al.* (1989, 1993, 2005); Pradhan (2008).

Habitat : Terrestrial, fossorial and nocturnal living close to human settlements and leading epizootic life.

Distribution : Peninsular India;

Status : Populations have been recorded from different localities in Western Ghats, Pondicherry, Kolkata, U.P. etc., IUCN Criteria proposed as per the CAMP Report (2005) :Least Concern; Indian Wildlife (Protection) Act (1972 as amended upto 2006) Schedule : Schedule : V (Vermin),*Source* : Pradhan *et al.* (1989, 1993, 2005).

Remarks : The species is considered to be a pest species since it causes damages to the food grains and public properties.

Suborder HYSTRICOMORPHA

Infraorder HYSTRICOGNATHI

Suborder *Hystricomorpha* is represented by a single family in Karnataka State.

Family HYSTRICIDAE

Family *Hystricidae* is represented by a single species under Genus *Hystrix* in Karnataka State.

*136. ***Hystrix indica*** Kerr

1792. *Hystrix cristata* var *indica* Kerr, *Anim. Kingd.*, : 213.

2000. *Hystrix indica* : Agrawal, V.C., *Rec. zool. Surv. India, Occ. Paper. No.*, **180** : 132-133.

Common Name: Indian crested porcupine.

Diagnostic Characters : Indian crested porcupine is characterized by the fur being modified into true quills or spines, angular process of mandible strongly distorted outwards, infraorbital foramen large and cheek teeth 4/4 in number and flat crowned. All porcupines are grouped under this family. The crested porcupines possess a short tail, less than one-fourth of Head and Body length and hollow quills at its tip. Molars hypsodont and rootless. A prominent crest present on crown and neck. Quills bear more than one brown bands. Head and Body more than 400 mm and in the range between 400-900 mm. Tail length always less than 20% of Head and Body length. Forelimbs and Hind feet broad and bear 5/5 fingers. Hallux clawed and well-developed. Skull large with occipitonasal length in the range of 139-163 mm. Palate long. Anterior half of the body including head dark brown, posterior part more white due to exposure of white tip of the quills. Each quill is ornamented with deep brown or black and white bands. The white quills on tail are large and well open. A narrow band of white-tipped spines form a collar. Undersurface of same colour as back. 3 pairs of mammary glands present.

Locality : Reported from Dharwar in Karnataka State (Agrawal, 2000). Sighting of porcupines in Nagarhole recorded by ZSI teams during NBR surveys.

Habitat : Terrestrial, fossorial and nocturnal rodent species found throughout India. The species is an out door species and generally lives in large pits and /or burrows dug in the cultivated plains, gardens, orchards pasture land, crop fields , waste lands and forests. This species appears to be the most ecologically adapted species.

Distribution : Throughout India.

Status : common; IUCN Criteria proposed as per the CAMP Report (2005): Least concern; Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule : IV.

Source : Ellerman (1961), Prater (1980), Corbet and Hill (1992), Agrawal (2000) and Alfred *et al.* (2002).

Remarks : *Hystrix indica* is considered to be an agricultural pest since it causes damage on large scale to the standing crops. Its gnawing habit to keep the ever-growing incisors in shape makes it a nuisance for the human life. It has a curious habit of gnawing bones, horns and antlers (Agrawal, 2000). The species is a prolific breeder. Agrawal (2000) concludes that there are no subspecies in *Hystrix indica.*

Order LAGOMORPHA

Order *Lagomorpha* is characterized by presence of two pairs of upper incisors placed one behind the other in each jaw and a distinct diastema (Open space) between incisors and cheek teeth (Molars) which are adopted for grinding. Three pairs of upper and two pairs of lower premolars. Tail very short.

Order *Lagomorpha* is represented by a single family *Leporidae* in Karnataka State.

Family LEPORIDAE

Family *Leporidae* is represented by a single species under Genus *Lepus* in Karnataka State.

*137. ***Lepus nigricollis*** Cuvier

1823b. *Lepus nigricollis* Cuvier, F. *Dictionnaire des sciences naturelle*, Strasbourg & Paris, **26** : 299-316.

2006. *Lepus nigricollis*: Alfred, Das and Sanyal, *Animals of India*: *Mammals*. ENVIS-*Zool. Surv. India*, Kolkata : 217.

Common Name: Indian Black-naped Hare or Indian Hare.

Diagnostic Characters : Rabbits, hares and pikas have been included in the mammalian order *Lagomorpha*. Principal distinguishing features of order *Lagomorpha* are clawed digits, soft and smooth pelage, very short and bushy tail (0-15% of Head and Body length), long diastema in front of cheek-teeth, canines absent, four incisors in the upper jaw and functional digits on fore/hind limbs 5/4. Genus *Lepus* is characterized by its hind legs much longer than fore legs, hind feet more than 60 mm (85-115 mm) and ears elongate and more than 30mm (80-120 mm). Pelage always smooth and soft but never harsh. Ears long, plain and not black-tipped. Head and Body length in the range 330-530 mm. Greatest skull length 80-100mm. 'Y'-shaped groove on I^1. The blacknaped Hare is distinctive in having a dark grayish black or black patch on the back of its neck from the ears to the shoulder. Tail black above, while white on sides and undersurface.

Locality : Sighting of Indian blacknaped hare in Bandipur and Nagarhole in Karnataka state reported during the survey by ZSI parties (Pradhan and Kurup, 2001).

Habitat : Terrestrial, fossorial and nocturnal species. The species is an out door species and generally lives in all types of habitats except at very high altitudes. Where the habitat is suitable for living, hares are numerous. This species appears to be the most adapted ecologically.

Distribution : Throughout India.

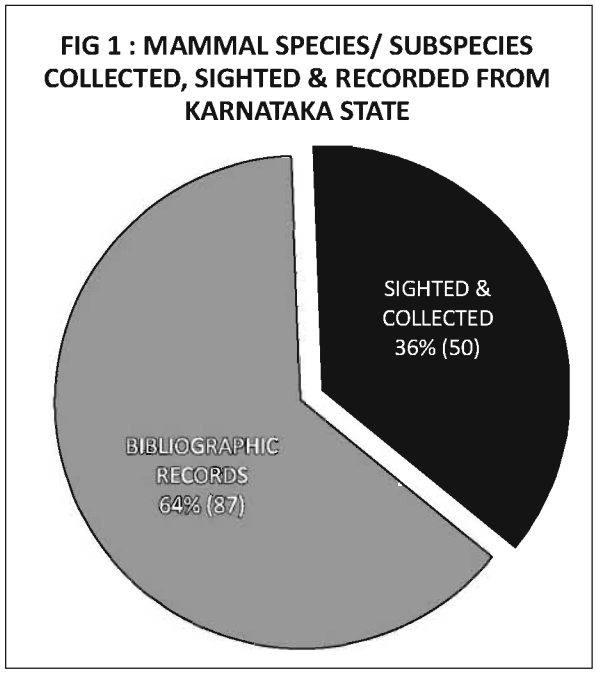
Status : Common; IUCN Criteria proposed as per the CAMP Report (2005): Least concern, Indian Wildlife (Protection) Act (1972, as amended upto 2006) Schedule: Schedule : IV.

Source : Prater (1980), Corbet and Hill (1992), Agrawal (2000), Pradhan and Kurup (2001); Alfred *et al.* (2002) and Menon (2003).

Remarks : *Lepus nigricollis* is considered to be causing damage to the agricultural fields, orchards etc. The species is a prolific breeder.

RESULT AND DISCUSSION

Systematic list of mammalian species given above reports occurrence of 137 mammal species/ subspecies in Karnataka State. Out of these, 50 species (36%) were actually collected and/or sighted by ZSI survey parties which visited Karnataka State during Faunistic survey of Nilgiri Biosphere Reserve (Nagarhole and Bandipur) and some districts of the state in the past, while 90 species (64%) were included in the list on the basis of the literature consulted (Fig. 1).



If the species/subspecies are sorted out in various categories given in Table 1, it will be seen that 137 species/subspecies of 84 genera belonging to 36 families grouped in thirteen mammalian orders have been reported from this region. The table further shows a broad spectral diversity at all the levels at every stage. It has been expressed very well particularly in orders like *Chiroptera, Carnivora, Artiodactyla* and *Rodentia.* Even marine mammal order, *Cetacea,* has shown remarkable representation in this region.

Fig. 2 shows order-wise representation of mammalian species. Class *Mammalia* is represented by thirteen orders with predominance of *Chiroptera, Rodentia, Carnivora, Artiodactyla* and *Cetacea* (Fig. 2 & 3). It will be seen that more than 75% mammalian species belong to the orders *Chiroptera, Carnivora* and *Rodentia.* Incidentally Chiropteran and rodent representation is very well in the region (Total 39 and 33 spp. respectively).

Some of the most interesting species reported from the state are :

Indian Hedgehog (*Paraechinus micropus* (Blyth);Horsfield Shrew(*Crocidura horsfieldii* (Tomes); Ceylon or montane Shrew (*Suncus montanus* (Kelaart); Painted Bat (*Kerivoula picta picta* (Pallas); Wroughton's free-tailed Bat

Table 1. Mammalian Diversity in Karnataka State

Sr. No.	Orders	Suborders	Families	Subfamilies	Genera	Species/ Subspecies
1.	ERINACEOMORPHA	-	1	1	1	1
2.	SORICOMORPHA	-	1	1	2	5
3.	SCANDENTIA	-	1	1	1	1
4.	CHIROPTERA	2	8	6	21	39
5.	PRIMATES	-	2	2	4	9
6.	CARNIVORA	2	7	8	17	25
7.	CETACEA	2	4	-	9	10
8.	SIRENIA		1	-	1	1
9.	PROBOSCIDEA	-	1	-	1	1
10.	ARTIODACTYLA		4	3	10	10
11.	PHOLIDATA	-	1	-	1	1
12.	RODENTIA	3	4	5	15	33
13.	LAGOMORPHA	-	1	-	1	1
Total	**Thirteen orders**	**9**	**36**	**27**	**84**	**137**

FIG 2 : ORDER-WISE MAMMAL SPECIES/ SUBSPECIES FROM KARNATAKA STATE (TOTAL 137)

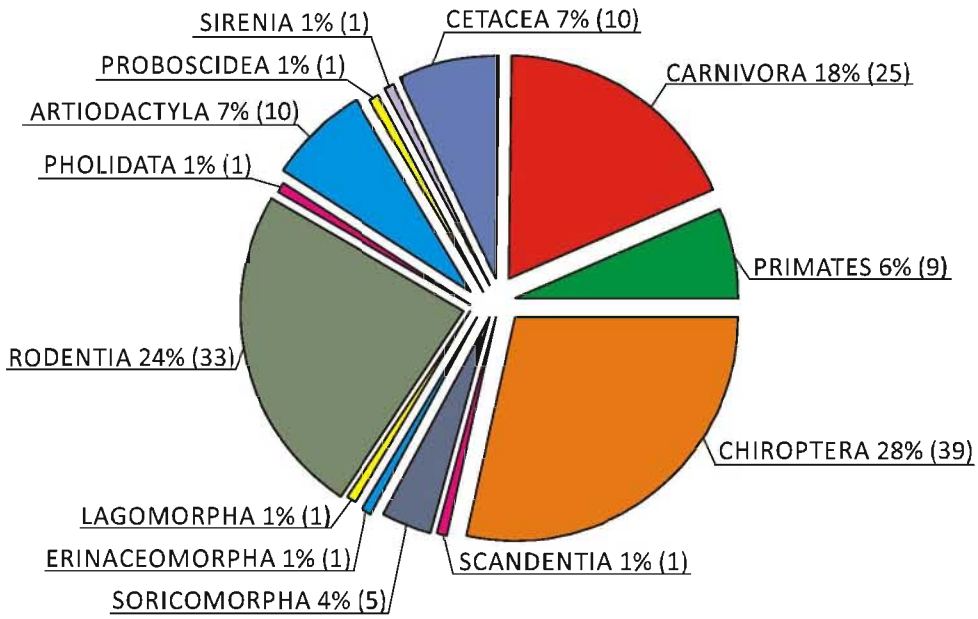
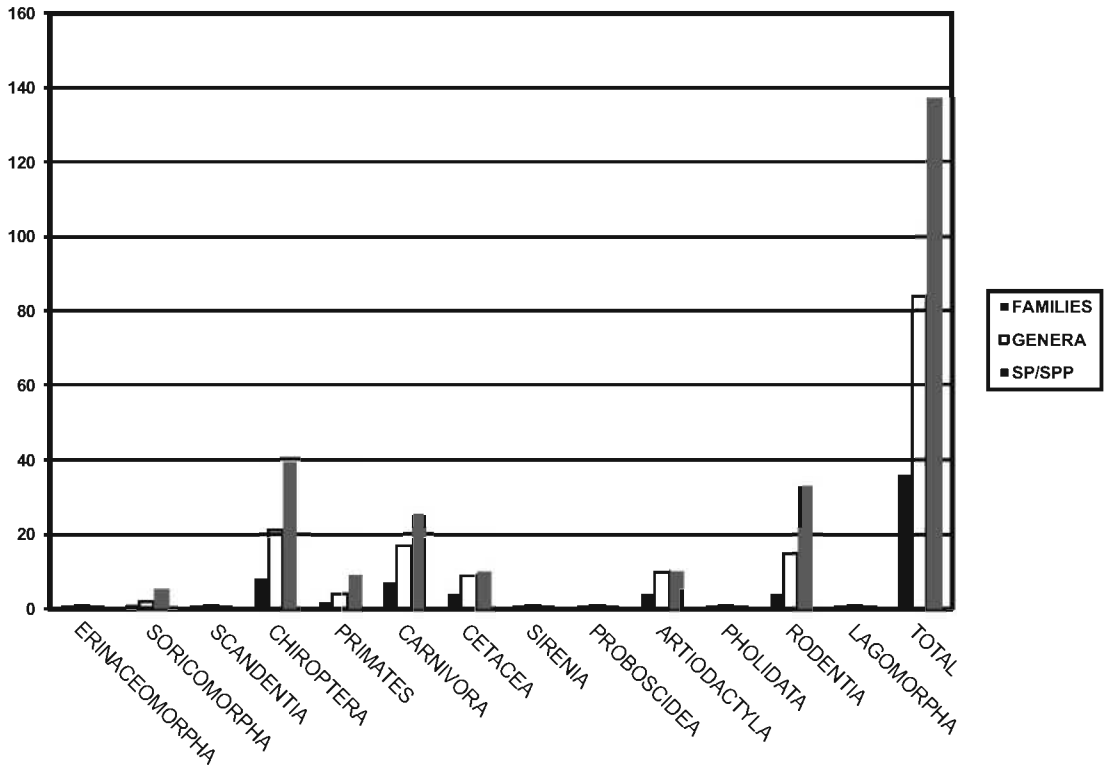
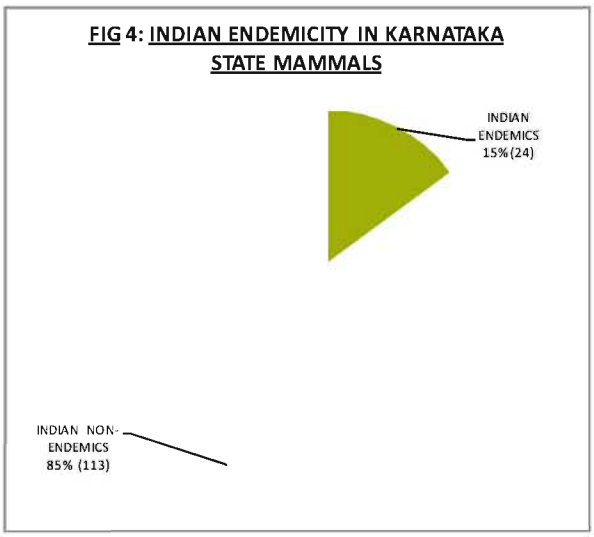


FIG-3 : ORDER-WISE MAMMALIAN DIVERSITY IN KARNATAKA STATE



(*Otomops wroughtoni* (Thomas); Malabar Slender Loris (*Loris lydekkerianus malabaricus* Wroughton; Lion-tailed Macaque (*Macaca silenus* (Linnaeus); Nilgiri Langur (*Trachypithecus johnii* (Fischer); Leopard/Panther *Panthera pardus fusca* (Meyer); Striped Tiger (*Panthera tigris tigris* (Linn.); Malbar Large-spotted Civet (*Viverra civettina* Blyth) ; Brown Mongoose (*Herpestes fuscus fuscus* Waterhouse); Oriental Small-clawed Otter (*Aonyx cinerea* Illiger); South Indian Yellow-throated Marten (*Martes gwatkinsii* Horsfield); Common Dolphin (*Delphinus delphis* Linnaeus); Spinner Dolphin (*Stenella longirostris* (Gray); Sperm Whale (*Physeter macrocephalus* Linnaeus); Dugong (*Dugong dugon* (Mueller); Indian Elephant (*Elephus maximus indicus* Cuvier); Indian Mouse Deer or Chevrotain (*Moschiola meminna* (Erxleben); Indian Gaur (*Bos gaurus* Smith); Grizzled Indian Giant squirrel (*Ratufa macroura dendolena* Thomas and Wroughton); Small Travancore Flying squirrel (*Petinomys fuscocapillus* (Jerdon) ; Malabar Spiny Dormice (*Platacanthomys lasiurus* Blyth) etc.

When the endemic status of the mammalian species/subspecies reported from Karnataka State was studied (Fig. 4), it was noticed that there were only 24 endemic species/subspecies (15% of total 137 mammalian species) belonging to orders *Scandentia* (1), *Chiroptera* (2), *Primates* (6), *Carnivora* (4) and *Rodentia* (11). Therefore, though mammalian species diversity is rich, the endemicity in this region is, however, poor. Interestingly, however, most of the rodent subspecies are endemic to Western Ghats only.



Order SCANDENTIA

1. *Anathana ellioti ellioti* (Waterhouse)

Order CHIROPTERA

1. *Hipposideros hypophyllus* Kock and Bhat
2. *Otomops wroughtoni* (Thomas)

Order PRIMATES

1. *Loris lydekkerianus lydekkerianus* Cabrera
2. *Macaca silenus* (Linnaeus)
3. *Semnopithecus achates* (Pocock)
4. *Semnopithecus anchises* Blyth
5. *Semnopithecus hypoleucos* Blyth
6. *Trachypithecus johnii* (Fischer)

Order CARNIVORA

1. *Paradoxurus jerdoni caniscus* Pocock
2. *Viverra civettina* Blyth
3. *Herpestes fuscus fuscus* Waterhouse
4. *Martes gwatkinsii* Horsfield

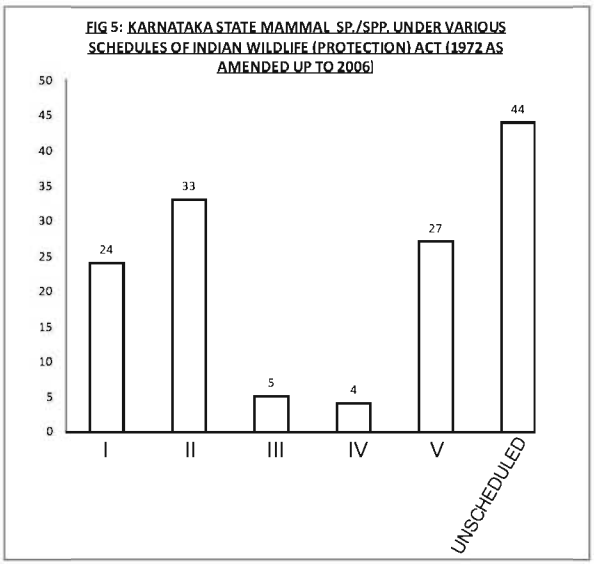
Order RODENTIA

1. *Funambulus tristriatus tristriatus* (Waterhouse)
2. *Funambulus tristriatus numarius* Wroughton
3. *Ratufa indica indica* (Erxleben)
4. *Ratufa indica maxima* (Schreber)
5. *Platacanthomys lasiurus* Blyth
6. *Vandeleuria nilagirica* Jerdon
7. *Cremnomys cutchicus* Wroughton
8. *Rattus rattus wroughtoni* (Hinton)
9. *Rattus satarae* Hinton
10. *Mus cookii nagarum* Thomas
11. *Mus platythrix* Bennet

Conservation status of the mammalian species under Indian Wildlife (Protection) Act 1972 (amended upto 2006) was also studied. It was found that 93 out of 137 mammalian species have been included in all the five schedules of the Act (Fig. 5). However, on the other hand, there are about 33 mammalian species, mostly

microchiropteran bat species, which have not been listed under any of the wildlife Act schedules.

There are four Critically Endangered mammal species reported from Karnataka State viz: Wroughton's free-tailed Bat (*Otomops wroughtoni*



(Thomas), Malbar Large-spotted Civet (*Viverra civettina* Blyth), Blue Whale (*Balaenoptera musculus* (Linnaeus) and Dugong (*Dugong dugon* (Mueller). Out of these, Wroughton's free-tailed Bat is known to live in a single large cave near Barapede Village in Belgaum district since last more than hundred years.

Table 2 summarizes order-wise IUCN categories of threats assigned to the mammalian species/subspecies as per CAMP Reports for Mammalia (1998), Chiroptera (2002),Primates (2003) and Small Non-Volant mammals (2005). According to these reports, there are four species under Critically Endangered category, 8 in Endangered and 18 in Vulnerable categories, while there are at least 71 species listed under Least Concern category (Fig 6). These belong mostly to *Rodentia and Chiroptera* orders. Lastly, there are three Carnivore and three Rodent species listed as Not Evaluated, because of their unstable

Table 2. Conservation Status (IUCN categories (National) as per CAMP Reports (1998, 2002, 2003 and 2005) of Mammal Species/Subspecies from Karnataka State.

Sl. No.	Orders	Critically En-dangered	En-dangered	Vulner-able	Lower Risk-Near Threatened /Near Threatened	Lower Risk-Least Concern / Least Concern	Data Deficient / Not Evaluated	Total
1	ERINACEOMORPHA	*	*	*	*	1	*	1
2	SORICOMORPHA	*	1	1	*	3	*	5
3	SCANDENTIA	*	*	*	1	*	*	1
4	CHIROPTERA	1	1	3	4	30	*	39
5	PRIMATES	*	2	2	3	2	*	9
6	CARNIVORA	1	1	5	9	6	3	25
7	CETACEA	1	1	*	8	*	*	10
8	SIRENIA	1	*	*	*	*	*	1
9	PROBOSCIDEA	*	*	1	*	*	*	1
10	ARTIODACTYLA	*	*	1	2	7	*	10
11	PHOLIDATA	*	*	1	*	*	*	1
12	RODENTIA	*	2	4	3	21	3	33
13	LAGOMORPHA	*	*	*	*	1	*	1
	TOTAL	**4**	**8**	**18**	**30**	**71**	**6**	**137**

taxonomic placement for quite sometime. They are *Aonyx cinerea* Illiger, *Lutra lutra nair* Cuvier, *Lutragale perspicillata* (Geoffroy), *Vandeleuria nilagirica* Jerdon, *Rattus satarae* Hinton, *Rattus norvegicus* (Berkenhout).

Further, 137 species include 56 species (41%) which are under higher conservation status(Indian Wildlife Act Schedule I and II, CITES Appendix I & II and IUCN Categories from Endangered to Vulnerable) (Fig. 7).

FIG 6: Conservation Status (IUCN categories (National) as per CAMP Reports (1998, 2002, 2003 and 2005) of Mammal Species/ Subspecies from Karnataka State

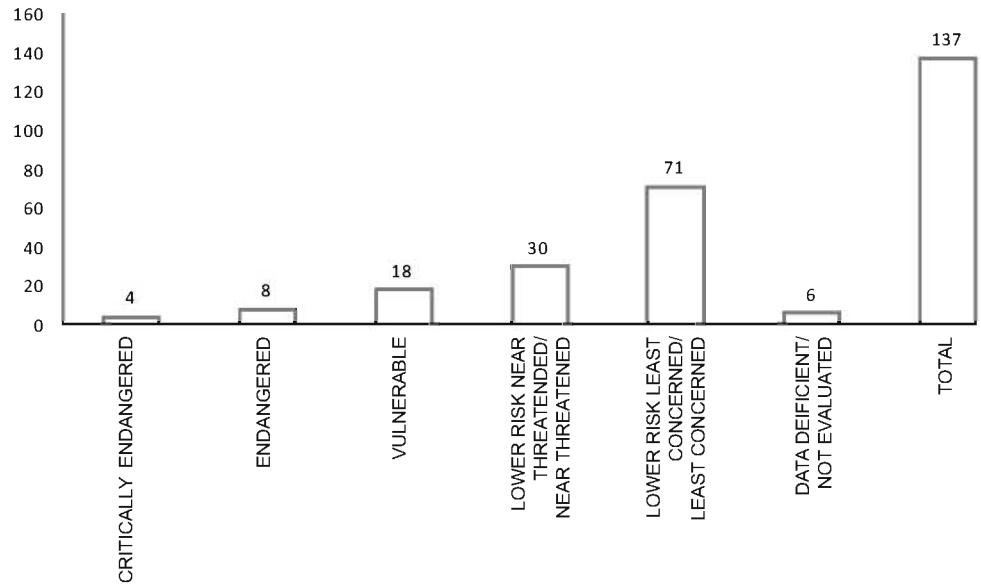
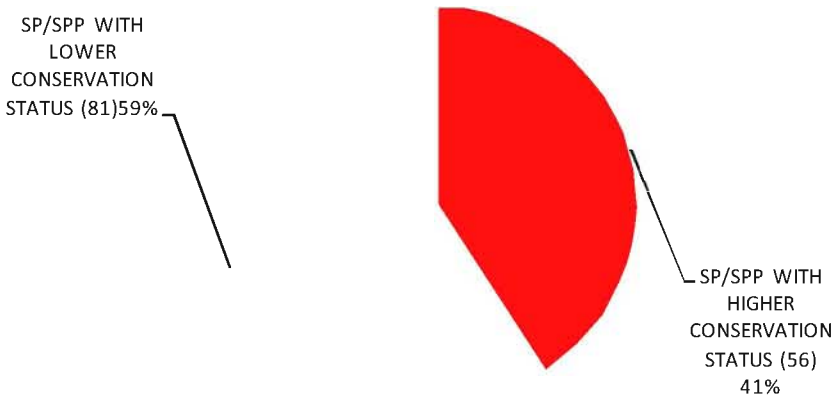


Fig 7: KARNATAKA STATE MAMMAL SP/SPP WITH HIGHER CONSERVATION STATUS



Finally, following conclusions can be drawn on the basis of above observations:

1. Endemicity of the mammalian fauna (25, 18% of total 137) in Karnataka State is mostly due to closeness to Western Ghats, one of the 25 biodiversity 'Hot Spots,' with its central and southern parts running along the west coast of the State.
2. Some of the most interesting mammalian species other than *Panthera tigris tigris* and *Panthera pardus fusca, which can attract attention,* are *Otomops wroughtoni*, *Viverra civettina, Lutragale perspicillata, Aonyx cinerea, Martes gwatkinsii, Bos gaurus, Elephas maximus, Petinomys fuscocapillus, Ratufa indica, Ratufa macroura,* etc. There is also record of movement of marine mammal species such as blue whale and sea cow along Karnataka coastline.
3. Fairly large number of mammalian species (56 : 41%) with higher conservation status of Schedule I and Schedule II of Wildlife (Protection) Act, 1972 (2002), CITES Appendix I & II and IUCN categories from Endangered to Vulnerable could be recorded, while about 24% of the total mammal species dominated by microchiropteran bats with no status under Wildlife (Protection) Act have also been reported from this region.
4. Thus, State of Karnataka shows most diversified, rich and varied mammalian elements.

ACKNOWLEDGEMENTS

The authors are grateful to the Director, Zoological Survey of India, Kolkata, for giving them the opportunity to undertake the assignment and also to Dr. Anil S. Mahabal, Scientist-F & Officer-in-Charge, ZSI, WRC, Pune for providing facilities.

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